

SIEMENS

MODULARIS Uro Plus

SP

Service Instructions

LITHOSTAR MODULARIS

© Siemens AG 2004

The reproduction, transmission or use of this document or its contents is not permitted without express written authority. Offenders will be liable for damages. All rights, including rights created by patent grant or registration of a utility model or design are reserved.

English

Doc. Gen. Date: 04.05

Print No.: SPL1-130.840.02.03.02

Replaces: SPL1-130.840.02.02.02

Chapter	Page	Rev.
all	all	03

Document revision level

The document corresponds to the version/revision level effective at the time of system delivery.
Revisions to hardcopy documentation are not automatically distributed.

Please contact your local Siemens office to order current revision levels.

Disclaimer

The installation and service of equipment described herein is to be performed by qualified personnel who are employed by Siemens or one of its affiliates or who are otherwise authorized by Siemens or one of its affiliates to provide such services.

Assemblers and other persons who are not employed by or otherwise directly affiliated with or authorized by Siemens or one of its affiliates are directed to contact one of the local offices of Siemens or one of its affiliates before attempting installation or service procedures.

	Page
1 General	1 - 1
Safety information and protective measures	1 - 1
Scope of applicability and regulations for the subsidiaries	1 - 1
Tools and measurement devices required.	1 - 2
Auxiliary devices and documents required	1 - 2
2 LITHOSTAR MODULARIS Error List	2 - 1
Info, E00 and E99	2 - 1
Water system, E10 – E12	2 - 1
Water system, E14 – E15	2 - 2
Controls, E20 – E21	2 - 2
Controls, E22 – E25	2 - 3
Controls, E26 – E29	2 - 4
Monitoring, E31 – E34.	2 - 5
Monitoring, E40 – E48.	2 - 6
Monitoring, E49 – E54.	2 - 7
High voltage circuit, E60 – E67	2 - 8
High voltage circuit, E68 – E74	2 - 9
High voltage circuit, E75 – E78	2 - 10
Internal errors, E80 – E89.	2 - 11
Ultrasound, E90 – E93	2 - 12
Displays on board D3	2 - 13
Text on the Console	2 - 13
"Chip card invalid"	2 - 13
LITHOSTAR MODULARIS SIEMENS	2 - 13
Missing Iso-center cross on the ultrasound system	2 - 13
3 Service software	3 - 1
(Hyper) Terminal program	3 - 1
German WINDOWS 95 / 98 / NT	3 - 2
English Windows 95 / 98 / NT	3 - 3
Working with the Terminal program	3 - 4
select option: h	3 - 5
select option: p.	3 - 5
select option: d.	3 - 5
select option: e.	3 - 6
select option: t	3 - 7
select option: c.	3 - 9
select option: i	3 - 10
select option: u.	3 - 10
select option: r	3 - 12
select option: s	3 - 12
Software download with Windows 95 / 98 / NT	3 - 13
select option: 0.	3 - 14

	Page
Text after replacing board D33 - 15
LITHOSTAR MODULARIS control panel3 - 16
4 LITHOSTAR MODULARIS	4 - 1
LITHOSTAR MODULARIS Parts overview	4 - 1
Shock wave head	4 - 2
Shock wave head covers	4 - 2
Removing the shock wave head	4 - 3
Installing the shock wave head	4 - 5
Replace isocenter phantom	4 - 7
Cooling unit	4 - 8
Checking the cooling unit	4 - 8
Replacing the cooling unit	4 - 9
Filling the cooling circuit	4 - 9
Filling the coupling circuit	4 - 9
Emptying the cooling circuit with the old pump (2/Fig. 10)	4 - 10
Emptying the cooling circuit with the new pump (3/Fig. 11)	4 - 11
Emptying the coupling circuit	4 - 11
Hose pump head in the coupling circuit	4 - 12
Removing the hose pump head	4 - 12
Installing the hose pump head	4 - 12
Hose pump head in the cooling circuit	4 - 12
Removing the hose pump head	4 - 12
Installing the hose pump head	4 - 12
IWAKI cooling pump	4 - 13
Removal	4 - 13
Installation	4 - 13
High voltage connector	4 - 15
Air suction hose	4 - 18
To support arm serial number 0050	4 - 18
From support arm serial number 0051	4 - 19
Board D3 or Chip card reader	4 - 20
Notice for LITHOSTAR MODULARIS <u>with the Gold card</u> :	4 - 20
Replacing board D3.	4 - 20
Board D3 Addition (Ultrasound)	4 - 21
Pressure measurement.	4 - 21
Potentiometer for angulation drive	4 - 22
Angulation drive (C-arm drive)	4 - 23
Adjusting switches S1/S2.	4 - 26
Setting the cam on the LITHOSTAR MODULARIS.	4 - 26
Balancing Spring for the Support Arm	4 - 28
Support arm replacement	4 - 30
Replacement of rotary joint lock	4 - 32
Replacing the probe	4 - 32
Sector Probe	4 - 32
Curved Probe	4 - 33

	Page
Concluding work.	4 - 33
5 Iso-center with X-Ray	5 - 1
Adjustment procedure	5 - 1
Adjusting the 0° position	5 - 2
Adjusting the 20° position	5 - 3
Concluding work.	5 - 4
Adjustment procedure	5 - 5
Adjusting the 0° position	5 - 6
Concluding work.	5 - 7
LITHOSTAR MODULARIS as "LithoShare" Execution	5 - 8
Adjustment.	5 - 8
6 Iso-center with ultrasound	6 - 1
Preparations.	6 - 1
Checking the target on the Sonoline G20	6 - 2
Check of image tilt.	6 - 3
7 Memoskop Programming	7 - 1
Standard programming	7 - 1
8 MUP Menu Ultrasound Device	8 - 1
Selection of the MODULARIS cross on the SONOLINE G20.	8 - 1
Ultrasound localization.	8 - 1
Selection of the MODULARIS cross on the SONOLINE Adara	8 - 2
Ultrasound localization.	8 - 2
Ultrasound localization.	8 - 3
Label for ultrasound unit.	8 - 4
MUT MODULARIS	8 - 4
Concluding work.	8 - 4
Overview of Functions	8 - 5
Readout the Software Version G20	8 - 7
Readout the Software Version Adara	8 - 7
9 Changes to the previous version	9 - 1

Page

Safety information and protective measures

- Adhere to the safety measures described



Dangerous X-ray radiation and/or dangerous electrical voltage during test and adjustment operations!

Disregarding safety precautions can result in death or serious bodily injury.

The following points must be observed:

- Disconnect the power cable when working on the system.
- Ensure compliance with the general safety requirements when working with the system under power.
- Switch off the power prior to replacing modules or boards.
- After all work has been completed and all covers have been installed, perform the protective conductor test according to ARTD-002.731.17...
- The protective conductor resistance must not exceed 0.2 ohms.
- When performing service work on the power-on module, (replacing the power-on module or replacing the power cable), the equivalent leakage current must be measured and recorded.

Checks and settings that need to be performed under X-ray radiation are identified by the radiation warning symbol . When performing adjustments labeled as shown here, appropriate radiation protection measures must be taken (see ARTD, Part 2).

Scope of applicability and regulations for the subsidiaries

Equivalent leakage current measurement

The equivalent leakage current must be measured where applicable under the requirements of DIN VDE 0751, Part 1.

Where DIN VDE 0751 does not apply, the subsidiaries should comply with the following regulations (refer to ARTD - 002.731.17, as well as the safety technical regulations for installation and maintenance).

The local national regulations apply primarily for the subsidiaries.

In the event that there are no existing local regulations, the following provisions should be adhered to in the interest of the safety of customers, patients, employees and third parties as well as the company.

Initial measured value

The equivalent leakage current measurement was performed at the factory and the value measured was entered in test protocol 1. The measurement was made at the line voltage and line frequency indicated in test protocol 1.

If the line voltage or the line frequency on-site deviates from the information indicated upon delivery of the Modularis Uro Plus, the values given are invalid. The values should be marked invalid (crossed out with the comment "invalid values" and the service engineer should sign and date this copy).

In this case, the equivalent leakage current must be measured again. The value may not exceed 1 mA according to DIN VDE 0751, Part 1.

The initial value measured must be documented.

Repeat measurements

When service or repair work is performed on the primary power supply circuit (e.g. repairs to the power-on circuit), the equivalent leakage current test must be repeated. The values measured in the subsequent test may not exceed the threshold value of 1 mA as specified in VDE 0751, Part 1. In addition, they may not exceed the initial measured value by more than 50%. If the value exceeds this threshold, the system must be repaired. The value measured must be documented.

Tools and measurement devices required

NOTE

The specified articles are listed in the SCT (Catalog Service Tools) if nothing else is indicated (the STC is a component of the Spare Parts Catalog).

- Standard service equipment
- Service PC (see Intranet Service Laptop for CSE's)
- PC connection cable, 5 m 99 00 440 RE999
- ESD equipment
- Protective conductor meter 44 15 899 RV090
- Digital multimeter, e.g. FLUKE 187 99 94 831
- Shock wave pressure test unit 30 95 408 J1008
- Adapter for C-head 98 17 347 J1008

Auxiliary devices and documents required

- SIREMOBIL Iso-C Service Instructions SPR2-230.061.01..
- Service Instructions Shock Wave Pressure Control SPL2-120.074.01..

NOTE

Error messages from the SIREMOBIL Iso-C have not been listed.
(Refer to the SIREMOBIL Iso-C service documents)

Info, E00 and E99

E00	Error Text: Possible cause/action:	System was switched on.
E99	Error Text: Possible cause/action:	The system was switched off without deleting the therapy data. Press the Reset button.

Water system, E10 – E12

LITHOSTAR MODULARIS circuit diagram J1048, sheets 13 and 14.

E10	Error Text: Possible cause/action:	Cooling system losing water. Is water running out of the hoses? P_{min} -switch o.k.? Board D3.X3 connection o.k.? Fill the cooling circuit.
E11	Error Text: Possible cause/action:	Maximum pressure in the cooling circuit exceeded. Pressure switch P_{max} responded. Are the hoses blocked, kinked? P_{max} -switch o.k.? Board D3.X3 connection o.k.? Is the cooling unit operating? Check the fill level in the cooling circuit.
E12	Error Text: Possible cause/action:	Minimum pressure in the cooling circuit exceeded. Pressure switch P_{min} responded. Is water running out of the hoses and hose connections? Air in the cooling system? Check the fill level in the cooling circuit.

Water system, E14 – E15

E14	Error Text: Possible cause/action:	Water level too low in the water reserve tank. Not enough water in the tank. Float switch in the tank o.k.? Board D3.X3 connection o.k.? Completely fill the coupling bellows, deselect automatic pressure regulation, and drain the water. Repair any leaks. Refill the water in the reserve tank.
E15	Error Text: Possible cause/action:	Coupling pressure not o.k. Pressure sensor on the shock head o.k.? If water can still be pumped out, the sensor is probably defective (refer to "Working with the terminal program: show diagnostic data"). Suction hose correctly inserted in the coupling bellows? Return hose kinked? Board D3.X8 connection o.k.? Fill the coupling circuit. If the error only occurs with obese patients, the suction hose in the coupling bellows may be kinked.

Controls, E20 – E21

If the control panel is dark: check fuse F5 on board D3.

E20	Error Text: Possible cause/action:	No contact with the control unit (this error is visible only when reading out the error log with the service PC). Connection cable X5 correctly connected to the control unit? Check fuse F5 on board D3. If the error occurs after replacing board D3 - is plug X35 properly connected?
E21	Error Text: Possible cause/action:	X-ray button on the control unit activated with switch on. X-ray button stuck? Control unit o.k.? Cable o.k.?

Controls, E22 – E25

E22	Error Text: Possible cause/action:	QRS signal from ECG unit missing, i.e. no ECG triggering possible. Trigger cable connected to ECG unit? ECG triggering selected on the control unit? Trigger cable plugged in on D3.X70?
E23	Error Text: Possible cause/action:	Motor for C-arm movement in LITHOSTAR MODULARIS draws too much current. C-arm moving freely? SIREMOBIL Iso-C cable connected? Brake in SIREMOBIL Iso-C can be released, i.e. the motor is not locked? Brake connection cable in SM Iso-C o.k.? (D3.X38 - SM Iso-C) Motor connection cable o.k. (board D3.X36)? Board D3? Motor connection cable o.k. (board D3.X36)? Settings for the SIREMOBIL Iso brakes o.k.? (Angulation and orbital in 0°. LITHOSTAR MODULARIS not coupled. Place spring scale at the handle near the I.I. Release angulation brake, pull with spring scale, the C-arm must move when the spring balance indicates a value from 20N, 30N, the closer to 20 N the better. Settings are made at the position where the angulation motor is coupled. Wrench size 30 mm, coupling must be removed). Refer also to SPR2-230.061.01... Chapter 7. Board D3?
E24	Error Text: Possible cause/action:	C-arm blocked. No change on the actual value potentiometer in LITHOSTAR MODULARIS. C-arm moving freely? Potentiometer o.k.? Correct tension on the belt? Connection cable to potentiometer o.k.? (D3.X38) Check the setting of the SIREMOBIL angulation brake (see E23)
E25	Error Text: Possible cause/action:	C-arm potentiometer not working. Potentiometer connected? Check plug D3.X30! Connect the cable to the potentiometer.

Controls, E26 – E29

E26	Error Text: Possible cause/action:	ECG option not installed. Warning message only.
E27	Error Text: Possible cause/action:	Control unit. Key sticks. Replace control panel.
E28	Error Text: Possible cause/action:	C-arm swivels in the wrong direction. Cables connected wrong at the potentiometer or the motor? Correct tension on the belt? Check the setting of the SIREMOBIL angulation brake (see E23).
E29	Error Text: Possible cause/action:	Shock wave release button sticks. Check control unit. Circuit diagram J1048 – 25.

Monitoring, E31 – E34

E31	Error Text: Possible cause/action:	Temperature sensor supplies incorrect data. Temperature sensor o.k.? Connection cable D3.X2 o.k.? The temperature difference can be read out on the service PC.
E32	Error Text: Possible cause/action:	The temperature at the shock wave head has exceeded the maximum value. Let the shock wave head cool down, but do not switch the system off! Check that the cooling unit is operating. If M1 cooling pump is running pump head may need to be replaced. If the error recurs, check the function of the cooling unit.
E34	Error Text: Possible cause/action:	Temperature cannot be determined: could not access the ADC when converting the analog values from the temperature sensor. Voltage supply for the temperature sensors outside acceptable range. Connection cable D3.X2 o.k.? Board D3? Read out the temperature with the service PC. Refer also to error 45.

Monitoring, E40 – E48

E40	Error Text: Possible cause/action:	Cooling pump fuse defective. Fuse F2 on board D3 o.k.?
E41	Error Text: Possible cause/action:	Cooling pump M1 defective. Motor M1 o.k.? Circuit diagram J1048 – 13 Connection cable D3.X7 o.k.?
E42	Error Text: Possible cause/action:	Coupling pump defective. Motor M2 o.k.? Circuit diagram J1048 – 13 Connection cable D3.X7 o.k.?
E43	Error Text: Possible cause/action:	Fuse for coupling pump defective. Fuse F3 on board D3 o.k.?
E44	Error Text: Possible cause/action:	5 volt power supply defective. Replace board D3.
E45	Error Text: Possible cause/action:	18 volt power supply defective. LED VCC18 on board D3 o.k. ? Circuit diagram J1048 – 11 Connection cable D3.X8 o.k.? Check the power supply for the pressure sensors!
E46	Error Text: Possible cause/action:	17 volt power supply defective LED VCC17 on board D3 o.k. ? Replace board D3.
E47	Error Text: Possible cause/action:	Valve and card terminal fuse defective? Short circuit? Fuse F4 on board D3? Circuit diagram J1048 – 13 Check valve (coupling circuit). Check card terminal.
E48	Error Text: Possible cause/action:	Reference for temperature sensors defective. Replace temperature sensors. Replace board D3.

Monitoring, E49 – E54

E49	Error Text: Possible cause/action:	Reference potentiometer defective. Short circuit in potentiometer for C-arm movement or potentiometer for ultrasound application (only if option is available)? Connection cable D3.X38, D3.X28 (ultrasound option) o.k.? Circuit diagram J1048 – 16/17. Use the Service PC to read the current potentiometer (menu "d"). For troubleshooting: the ultrasound option is available; remove the board for the ultrasound option and cables X28 and X29 from board D3.
E50	Error Text: Possible cause/action:	-5 volt power supply defective. Replace board D3.
E52	Error Text: Possible cause/action:	Battery voltage for battery-buffered RAM and real-time clock too low. Replace the lithium battery on board D3.
E53	Error Text: Possible cause/action:	Incorrect data in the battery-buffered RAM. Normal occurrence at initial start-up or after replacing the lithium battery. Check the lithium battery! Replace board D3. Perform a software download!
E54	Error Text: Possible cause/action:	Clock stopped (this message is also displayed when the battery is replaced) Connection cable D3.X31 - XP7 present under the cover? Set the clock!

High voltage circuit, E60 – E67

LITHOSTAR MODULARIS Circuit diagram J1048 - 12.

E60	Error Text: Possible cause/action:	Charging current too low during the charging process. Check the line voltage! Replace the charging / energy unit!
E61	Error Text: Possible cause/action:	Overtension in the charging unit. System OFF - 10 minute pause - System ON. Replace the charging / energy unit!
E62	Error Text: Possible cause/action:	Overtemperature in the charging unit. Heat in the LITHO MODULARIS ? System OFF - 10 minute pause - System ON. Replace the charging / energy unit!
E63	Error Text: Possible cause/action:	Capacitor defective in the charging / energy unit (out of tolerance). Replace the charging / energy unit!
E64	Error Text: Possible cause/action:	Default voltage not attained. Current voltage after frequency converter (U_{nom}) is greater than selected voltage. Check the fiber optic cable! ¹⁾ Replace the charging / energy unit!
E65	Error Text: Possible cause/action:	Charging voltage too high during the charging process. Replace the charging / energy unit!
E66	Error Text: Possible cause/action:	Default voltage incorrect. Check the fiber optic cable! ¹⁾ Replace the charging / energy unit!
E67	Error Text: Possible cause/action:	No ignition of spark gap after trigger pulse (several times). Check the fiber optic cable! ¹⁾ Replace the charging/ energy unit!

High voltage circuit, E68 – E74

E68	Error Text: Possible cause/action:	Charging current too high during charging process. Replace the charging / energy unit!
E69	Error Text: Possible cause/action:	Repeated self-ignition of the spark gap. Replace the charging/ energy unit!
E70	Error Text: Possible cause/action:	Charging current too low after ignition! Check the connections of the high voltage cable! Check the high voltage connector! Replace the shock wave head!
E71	Error Text: Possible cause/action:	Charging current too high after ignition. Check the high voltage cable! Check the high voltage connector! Replace the shock wave head!
E72	Error Text: Possible cause/action:	No communication possible with the charging / energy unit. Check the line voltage at the charging / energy unit! Replace the fuse in the charging / energy unit! Check the fiber optic cable! ¹⁾ Replace the charging / energy unit!
E73	Error Text: Possible cause/action:	Message: Constancy limit reached. For user information only. Approx. 10-15 treatments still possible, then error 74 appears.
E74	Error Text: Possible cause/action:	Constancy limit reached. The constancy limit has been reached. Replace the following parts: - shock wave head In addition, replace the water in the entire system!

- ¹⁾ Before replacing the charging / energy unit, check the fiber optic cable (LWL):
 - Disconnect the fiber optic cable on both ends and check by holding it up to the light
 or
 - place it on the Clk (U5) of board D3 and check whether light is visible.

High voltage circuit, E75 – E78

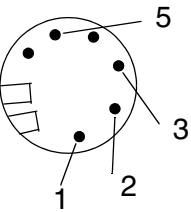
E75	Error Text: Possible cause/action:	Chip card terminal error (documented in error log only). Check execution level for board D3: AS 00 - 02: replace board D3. AS 03 and higher: replace chip card reading device. Wrong card or card incorrectly inserted.
E76	Error Text: Possible cause/action:	Chip card expired Insert a new card.
E77	Error Text: Possible cause/action:	Chip card communication error Check execution level for board D3: AS 00 - 02: replace board D3. AS 03 and higher: replace chip card reading device Cable? If the error recurs after replacing board D3, is plug X33 properly connected?
E78	Error Text: Possible cause/action:	Charging process too long. Line voltage o.k.? Replace the charging / energy unit!
E79	Error Text: Possible cause/action:	Call Service HV-cable ok? Short circuit?

- 1) Before replacing the charging / energy unit, check the fiber optic cable (LWL):
- Disconnect the fiber optic cable on both ends and check by holding it up to the light
or
 - place it on the Clk (U5) of board D3 and check whether light is visible.

Internal errors, E80 – E89

E80	Error Text: Possible cause/action:	Flash memory defective. Not applicable for the user. Read out the memory and perform a reset at the next opportunity.
E81	Error Text: Possible cause/action:	CMOS pulse counter incorrect. If this error occurs repeatedly, board D3 must be replaced.
E82	Error Text: Possible cause/action:	Pulse counter backup incorrect If this error occurs repeatedly, board D3 must be replaced.
E83	Error Text: Possible cause/action:	CMOS chip card data incorrect
E85	Error Text: Possible cause/action:	Measurement acquisition incorrect.
E86	Error Text: Possible cause/action:	Flash memory defective Not applicable for the user. Read out the memory and perform a reset at the next opportunity.
E89	Error Text: Possible cause/action:	Watchdog responded. If this error occurs repeatedly, board D3 must be replaced. Appears each time a reset is done with switch S3 on board D3. This error may occur if the system is switched off during initialization.

Ultrasound, E90 – E93

E90	Error Text: Possible cause/action:	No connection from LITHOSTAR to SONOLINE
E91	Error Text: Possible cause/action:	<p>Potentiometer skips. Cable from potentiometer to board D3 ok? Potentiometer defect?</p>  <p>Plug at US holder Value between 1 -3 and 2-5 must be identical.</p>
E92	Error Text: Possible cause/action:	<p>The two potentiometers have different values. Dampness on the potentiometer.</p>
E93	Error Text: Possible cause/action:	<p>Erroneous US values. C-MOS has lost values. Perform potentiometer adjustment (Point "U" in the service menu). Check default values (see SPL1-130.038.01...).</p>

Displays on board D3

Once the system is turned on, different symbols are displayed chronologically on the display of board D3.

Display	Possible cause/action
0	System o.k. (only with the ultrasound localization option and if a communication was set up to the ultrasound device.)
d	Software download.
1	Data transfer, the decimal point is flashing.
4	The receiving file is being checked.
5	Software download time too long.
7	Everything o.k. (only if no ultrasound localization option is available or if the ultrasound device is turned off.)
-	The service switch is set to normal mode - only for boards that still have no software.

Text on the Console

"Chip card invalid"

This message is displayed when:

- the gold card is still logged on a different LITHOSTAR MODULARIS
- board D3 was replaced and the "init counter" on the gold card is already set at 3.
- the card is defective.

In normal mode, check whether the LED 174 on board D3 blinks temporarily and then remains lit when turning it on.

LITHOSTAR MODULARIS SIEMENS

This message is displayed when too many errors occur. In this case, use the service PC to generate an error log.

Missing Iso-center cross on the ultrasound system

There is no communication between the ultrasound system and the LITHOSTAR MODULARIS.

This page intentionally left blank.

(Hyper) Terminal program

The Windows program (Hyper) Terminal is used to retrieve error codes, settings, shock wave counts, etc. from the LITHOSTAR MODULARIS and to save them to diskette.

The error log and therapy data can only be deleted from the CPU board using this (Hyper) Terminal program.

This program is usually located under Accessories in WINDOWS.

The following provides a short overview of the connection procedure.

The standard cable (99 00 440 RE999) is used as the connection cable between the service PC and the LITHOSTAR MODULARIS.

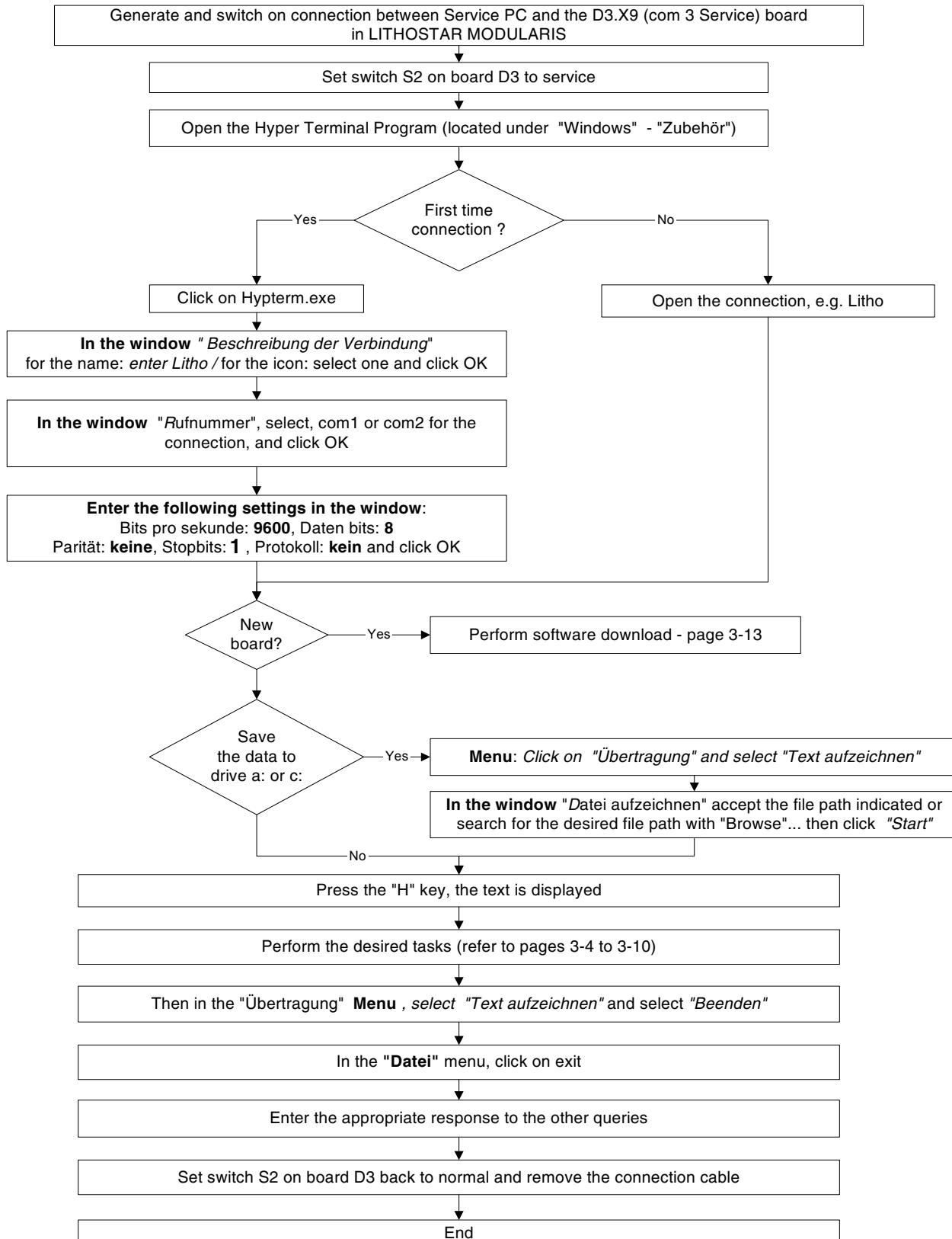
NOTE

Due to the numerous versions and languages for WINDOWS, the connection procedure is described in German and English.

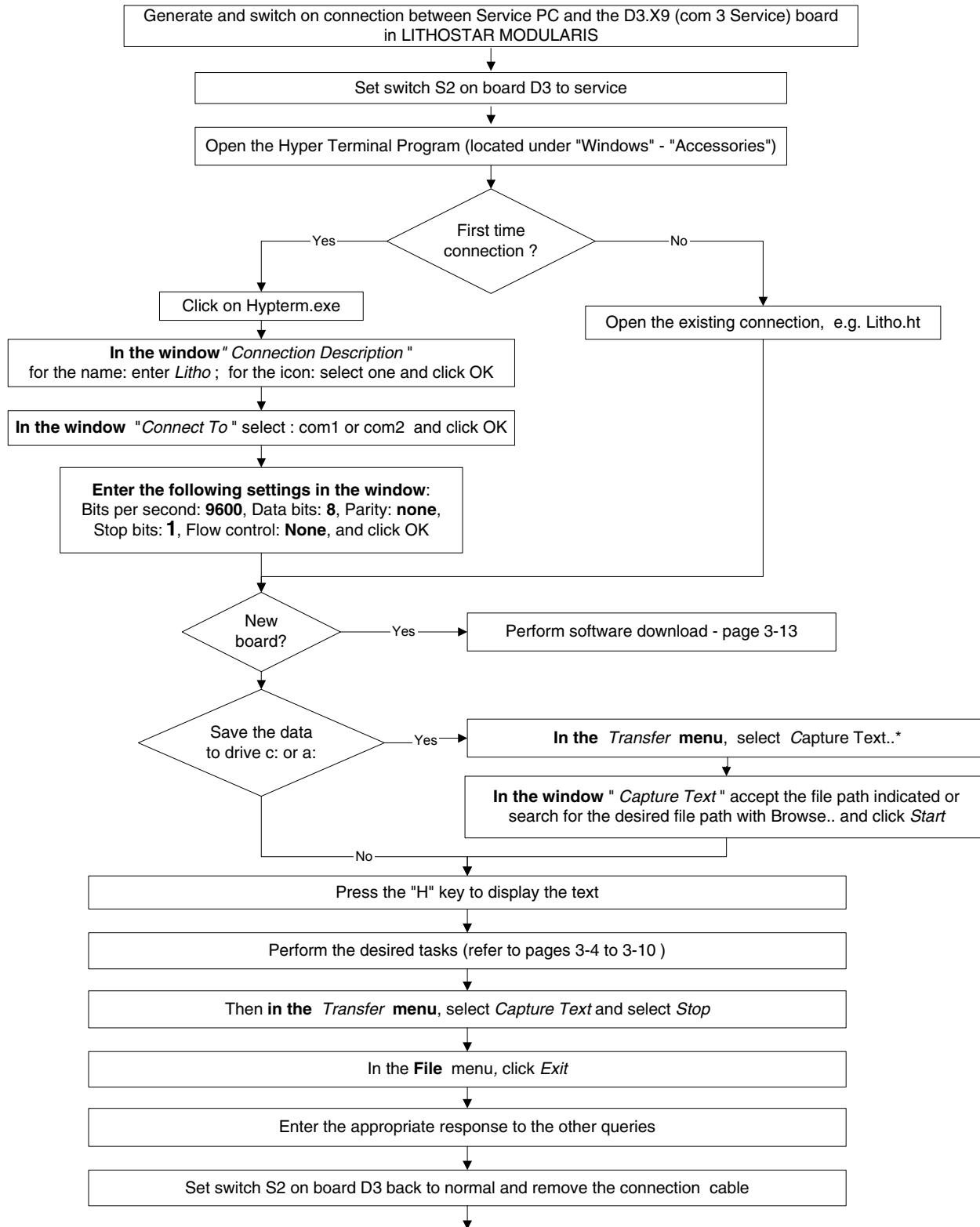
In case of problems, use the Help function in the (Hyper) Terminal program.

The font "Courier New" is recommended for reading data stored on the diskette.

German WINDOWS 95 / 98 / NT



English Windows 95 / 98 / NT



***Additional Information:** In order to save the information from LITHOSTAR MODULARIS, it is best to save the desired file as a text file. Basic procedure: open Windows Explorer, open the folder e.g. Temp, then click on the "File" menu and click on New / Text file and enter the name for the text file.

Working with the Terminal program

Once you create a connection between the service PC and the LITHOSTAR MODULARIS, press the "**h**" key to display the following text:

You will be notified if the software version is not compatible with the hardware version.
Refer to document SPL1-130.038.01... (Intranet) for default values.

```
-----< SIEMENS LITHOSTAR MODULARIS >-----
software version: V_ _ _ hardware: _ _ - _ -
select option:
=====
h: show this help screen
p: show pulse counters
d: show diagnostic data
e: show error log           100 errors present
t: show therapy data
c: show chipcard data

a/b: adjust c-arm turn-back (a=-, b=+) now: 1200 ms
i: install/remove option ECG-trigger now: not installed
u: adjust ultrasound localization
r: set pulse rate           now: variable 1/1.5/2 Hz
s: download new software
o: change orientation of treatment table. Now: -----   -----
:      \_/
(X) = Physician's place for (X) :       :
endourolog. therapy          :       :
:       :
-----
```

The following will be displayed if the software version is not compatible with the hardware version:

```
-----< SIEMENS LITHOSTAR MODULARIS >-----
software version: V_ _ _ hardware: _ _ - _ -
** Error: software is not compatible with hardware and/or EPLD-version **
** System will not work ! Please download appropriate software. **

select option:
=====
h: show this help screen
p: show pulse counters
...
o: change orientation of treatment table. Now: -----   -----
:      \_/
(X) = Physician's place for (X) :       :
endourolog. therapy          :       :
:       :
-----
```

select option: h

- Press the "h" key to display the input menu.

select option: p

- Press the "p" key to display the following text:

```
=> P
number of pulses:
    system:          3627
(1) shock head:      3627
(2) capacitor:       3627
(3) spark gap:        3627

select 1..3 to delete pulse counter, any other key to abort
please note values or save to file before deleting data !
```

The total number of shock waves released are displayed.

The counters for the shock head / capacitor / spark gap can be reset to zero.

Always perform this procedure when replacing one of these parts, i. e. the "spark gap" counter must be reset to zero if the charging unit is replaced.

select option: d

Press the "d" key to display the following text

```
⇒ D
'x'=exit
sensors           HV     P-bellow C-arm poti      US poti1      US poti2
(C-grade)         (V)    (mV)      (mV)          (mV)          (mV)
24.15    23.97    20      756       5100          6300          6250
24.21    24.00    20      749       5100          6300          6250
```

sensors (C-grade)	Displays the temperature at the shock wave head in celsius. The difference between both temperature values may not exceed a maximum of 3° C.
HV (V)	Displays the voltage at the high-voltage capacitor. If there is no connection to the charging unit (i.e. fiber optic cable removed), the value is 20460.
P-bellow (mV)	Displays the pressure in the coupling bellows. P-automatic selected and rinse ended: Q 500 mV – 2000 mV o.k.
C-arm pot (mV)	Current voltage at the potentiometer for the angulation motor.
US poti1/2 (mV)	Current voltage at the potentiometer for the US applicator. Acceptable deviation: 50. When US localisation is not available the value is 9995.

select option: e

- Press the "e" key to display the following text:

```
=> E

no. date      time      err code      100 error messages:
100 02/04/1999 14:43.20 E00:
.
.
.
002 02/04/1999 09:18.36 E70:
001 02/04/1999 09:18.27 E70:
last watchdog-error code: 3F
-- end of errorlog --

press key 'D' to delete error log, any other key to abort
please save error log to file before deleting it !
```

- The number of errors present in the Errorlog is indicated (e.g. 100 error messages), as in this case.
- The last 250 errors maximum are indicated; these are shown in blocks of 20. Between these blocks is the line "press space to continue, "x" to exit".
- In order to have a better overview, with the code E00 the system powerup is shown.
- The oldest error has the number 1; the most recent error is all the way at the top.
- The line "last watchdog-error code" is internal information.
- The errors can only be deleted in the system after all error numbers have been viewed.

select option: t

- Press the "t" key to display the following text:

```
=> T
available data:
date (m/d/y)    no. of patients
-----
03/01/1999      4
03/02/1999      4
03/03/1999      3
03/04/1999      3
03/05/1999      5
03/06/1999      5
03/07/1999      9
03/12/1999      7

enter 'A' to list all data:    40 patients, approx.    20 kByte of data
     or
enter date of one file to read, press 'space' to stop display
format mm/dd/yyyy (x=exit):
```

Displays all days for which therapy data exists, as well as the number of patients.
To select the day: enter month/day/year.

The following data is displayed for each treatment (max 40):

- each increase in energy level
- the number of shock waves for each of the energy levels
(energy levels between 0.1 and 1.0 will be summarized in steps of 0.1)
- any errors that occurred
- the text output can be temporarily stopped at any time with the "Space" key.

Entering "A" is only recommended for saving all data to a diskette.

The data cannot be deleted until they have been read (on a workday).

Selecting delete will erase **all** therapy data.

Content of Therapy log (selected day):

Patient no. 0001 start of therapy: 03/03/1999 17:03.15

----- table of energy-level (*10) : pulses -----

1:0012 ** E60: 32:0041 ** E60: -:..... -:..... -:..... -:..... -:..... -:.....
-:..... -:..... -:..... -:..... -:..... -:..... -:..... -:..... -:..... -:.....
-:..... -:..... -:..... -:..... -:..... -:..... -:..... -:..... -:..... -:.....
-:..... -:..... -:..... -:..... -:..... -:..... -:..... -:..... -:..... -:.....
End of therapy: 03/03/1999 17:03.24

Example:

- 1:0012 - 12 shock waves with an energy step between 0.1 and 1.0 (energy steps between 0.1 and 1.0 are summarized in intervals of 0.1) released).
- **E60 - error 60 has occurred.
- 32:0041 - 41 shock waves with energy steps 3.2 released.
- **E60 - error 60 has occurred again.

----- end of therapy data -----

press key 'D' to delete all therapy data, any other key to abort

please save therapy data to file before deleting it !

Once all of the therapy data for a day is listed, the above text will be displayed. Press the "d" key to delete **all** therapy data.

select option: c

- Press the "c" key to display the following text::

```
=> C

Card Data:
# Serial number Type -----< units >----- eject-date/time      pulse-count
          GOLD init-cnt ... ...
          PPU   on card   int.   from card      system

-----
1:
2:
3:53148300000000 G init=2 .... .... 04/13/1999 15:48.11 418
4:53149100000001 P 89956 0 0 04/13/1999 16:00.21 418
5:53148300000000 G init=3 .... .... 04/13/1999 16:40.51 418
6:53149100000001 P 84956 0 5000 04/13/1999 17:45.00 418
7:
8:
9:
10:53149100000001 P 84956 5000 0 card locked to unit .....
-- end of card data --
```

Text:	4:	531...0	G	init=2	04/13 ...	418
Explan.:	*1	*2	*3	*4	*5	*6	*7	*8

- *1: sequential number of the card inserted.
- *2: serial number of the card.
- *3: a "gold" card was inserted, i.e. the input slot is closed.
- *4: init-counter in the above example is init=2, i.e. the gold card was logged onto two different D3 boards.
- *5: n.a.
- *6: n.a.:

Card ejected	- *7: Date of ejection
	- *8: System shock wave counter value when card ejected
Card in system	- *7: Text: "Card locked to unit"
	- *8:

Text:	5:	531...1	P	89956	0	0	04/13 ...	418
Explan.:	*1	*2	*3	*4	*5	*6	*7	*8

- *1:sequential number of the card inserted
- *2: serial number of the card
- *3: a "pay per use" card was inserted
- *4: shock waves still present on the card
- *5: internal system card counter
- *6: number of shock waves registered on inserting the ppu card

Card ejected	- *7: Date of ejection
	- *8: System shock wave counter value when card ejected
Card in system	- *7: Text: "Card locked to unit"
	- *8:

select option: a/b**NOTICE****You do not have to save changes**

- Press the "**a**" key to reduce the time by 50 ms
i.e. from 1200 ms to 1150 ms.
- Press the "**b**" key to increase the time by 50 ms
i.e. from 1200 ms to 1250 ms.

In case of problems decoupling the angulation motor, the motor follow-on time for relaxing the coupling can be changed.

Time < 300 and > 5000 cannot be selected.

select option: i

- Press the "**i**" key to display the following text:

```
=> I
are you sure to install optionECG-trigger ?
press '1' to confirm, any other key to abort
```

After pressing the "1" key and then the "h" key, display for "selection option i" reads "now: installed".

select option: u

- Press the "**u**" key to display the following text:

```
=> U
---- submenu ultrasound adjust ----

to adjust marker position move applicator onto target
(see service instruction) and press key 'j'

actual value :     - - -

change values for sector applicator - Press key 's'
change values for convex applicator - Press key 'c'

press key 'x' to exit
```

- If the potentiometer has to be adjusted (i.e. after board D3 is replaced or after the D3 ultrasound addition), then perform the following procedure:
- Push the probe receiver all the way to the front so that the space between the probe and the iso-center phantom is very small when the iso-center phantom is raised.
- After pressing the "j" key, after "actual value: established value (max. 500) appears.

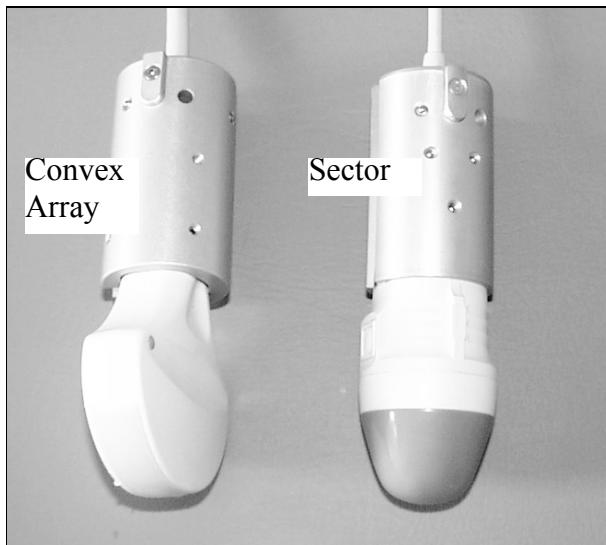


Fig. 1

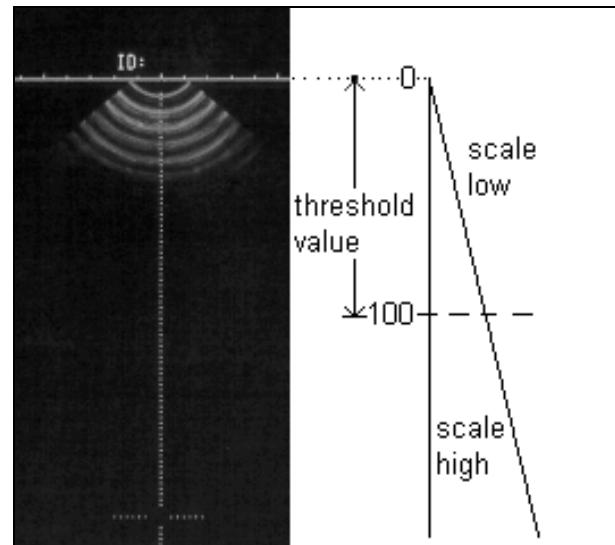


Fig. 2

⚠ CAUTION

The following values can only be altered if approval is given by Erlangen.

The correct values can be found in document SPL1-130.038.01.. (Intranet).

change values for sector applicator - Press key 's'
change values for convex applicator - Press key 'c'

Explanation:

The displayed position (distance and position) of the objects on the ultrasound image is calculated from the time difference between sending a signal and receiving the echo.

The standard speed of sound in the human body is 1540 m/sec, however, this speed can vary depending on which tissue is being examined.

The position of the iso-center can be adjusted to ensure that the position of the cross matches the actual stone position on the ultrasound monitor.

This is possible with:

SECTOR APPLICATOR				
actual values	change with key	(-)	(+)	
threshold value =	100 mm	t	T	
scale low =	7.7 %	l	L	
scale high =	7.7 %	h	H	

CONVEX APPLICATOR

actual values	change with key	(-)	(+)
threshold value =	100 mm	t	T
scale low =	7.7 %	l	L
scale high =	7.7 %	h	H

Every probe can be set to one of three settings:

threshold value fig. 2	The point at which the "scale high" value is used (default 100 mm).
scale low fig. 2	Correction factor (default 7.7 %) between 0 mm and the "threshold value" (This value is useful for thin patients).
scale high fig. 2	Correction factor (default 7.7 %) between "threshold value" and end (This value is useful for obese patients.).

By selecting the keys "t, l, h" (depending on application) the value is reduced; select T, L, H to increase the value.

select option: r

- Press the "**r**" key to change the "pulse rate"
Selection: fixed 2 Hz (USA) or variable 1/1.5 /2 Hz

After pressing the "h" key, display for "selection option r" shows the pulse rate set.

select option: s



Software download.

If not observed, D3 board can be damaged.

The system and service PC must not be turned off during a software download. If this occurs, board D3 must be replaced.

Software downloads are possible only if the software and hardware are compatible.

- Press the "**s**" key to display the following text:

```
=> S
press key '1' to confirm download, any other key to abort
```

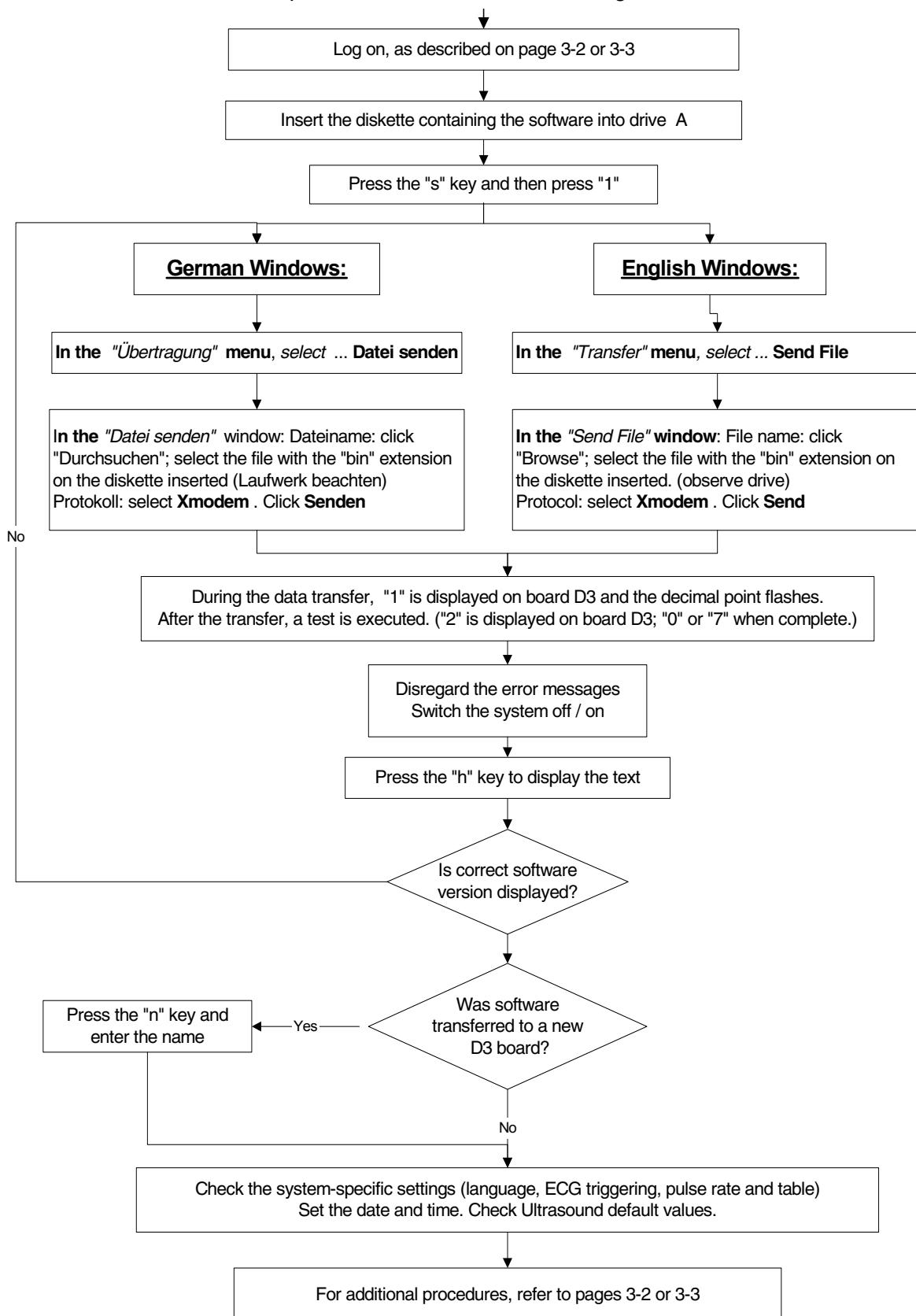
After "1" has been entered, the software download must start within 60 seconds.

If the 60 seconds elapses without starting the download, reselect "h" from the entry menu, reselect "s", etc.

Once the software download is complete, check that the values in the "ultrasound localization" menu for the applicators are identical to those in document SPL1-130.038.01.. (Intranet). If this is not the case, make the appropriate changes.

Software download with Windows 95 / 98 / NT

Do not select "capture text file" when downloading the software.



select option: 0

- Press the "**o**" key to switch from the right side to the left side of the table. This may only be done if the table has also been mechanically modified, refer to MODULARIS Uro Installation and Start-up instructions.

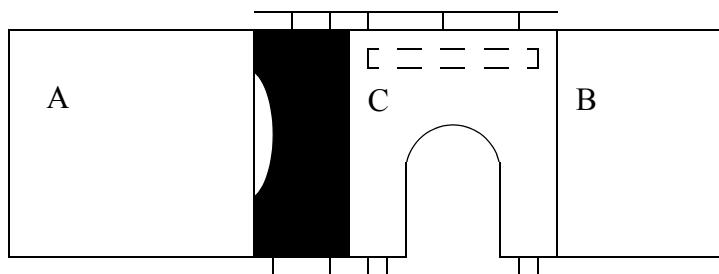
After pressing the "h" key, the display for "selection option o" will show which table was selected.

Delivery configuration is right table (Fig. 3).

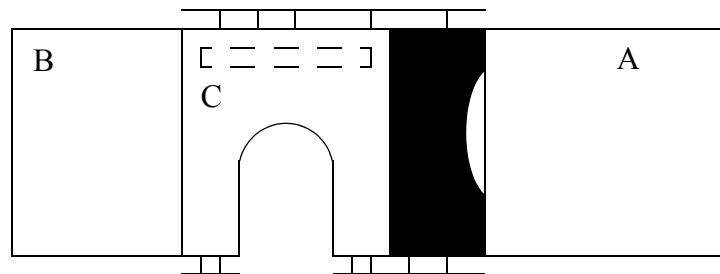
Left table

Right table

o: change orientation of treatment table. Now: -----
: _ / :
(X) = Physician's place for (X) : :
endourolog. therapy : :
: :
: :



Left side version



Right side version

Fig. 3

Text after replacing board D3

- Press the "h" key to display the following text (the software is installed).

```
-----<      XXXXXXXX      Lithomodule      >-----
-----  
n: select system name before shipping !  
-----  
software version: V_ _ _ _ _ hardware:_ _ _ _ _  
  
select option:  
=====  
h: show this help screen  
p: show pulse counters  
...  
...  
...  
o: change orientation of treatment table. Now: -----  
: \ / :  
(X) = Physician's place for (X) : :  
      endourolog. therapy : :  
-----
```

- Press the "n" key to display the following text

```
=> N  
select number to define system name:  
1: SIEMENS  
2: OEM-customer
```

- Press 1 or 2 and follow the instructions.

```
you selected: SIEMENS  
press 'C' to confirm, any other key to abort  
SIEMENS
```



This procedure cannot be undone.

LITHOSTAR MODULARIS control panel

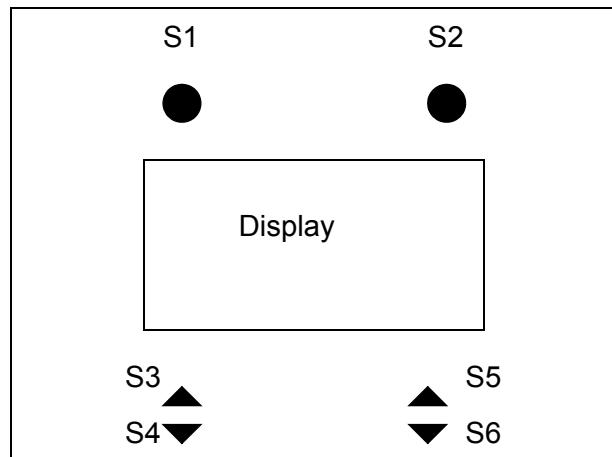
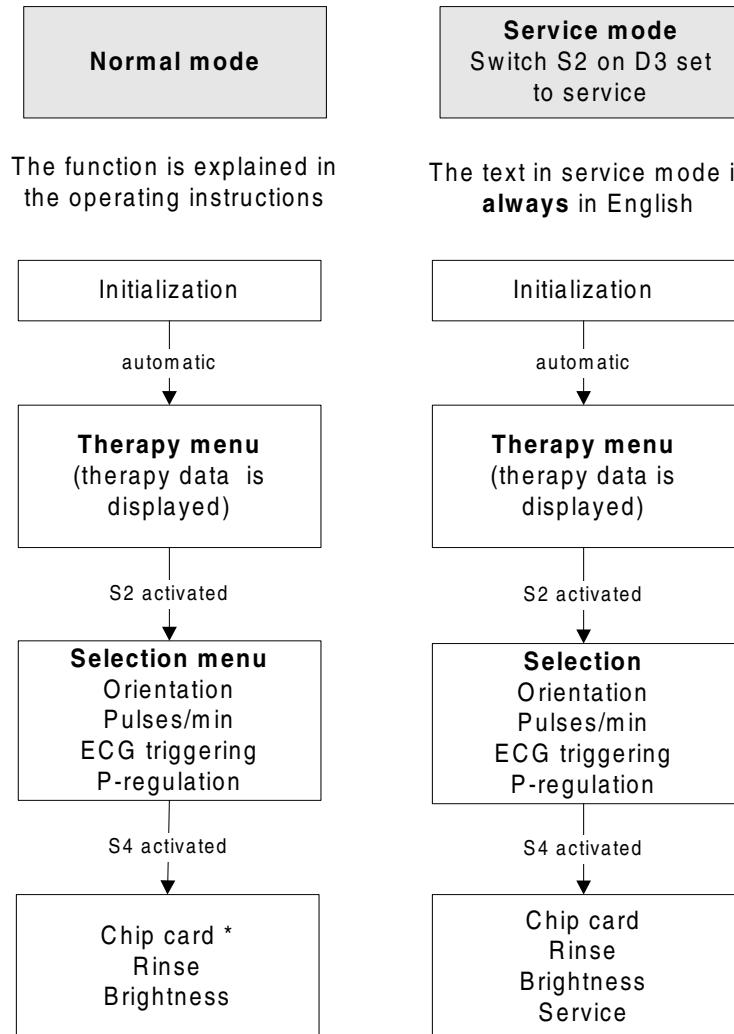
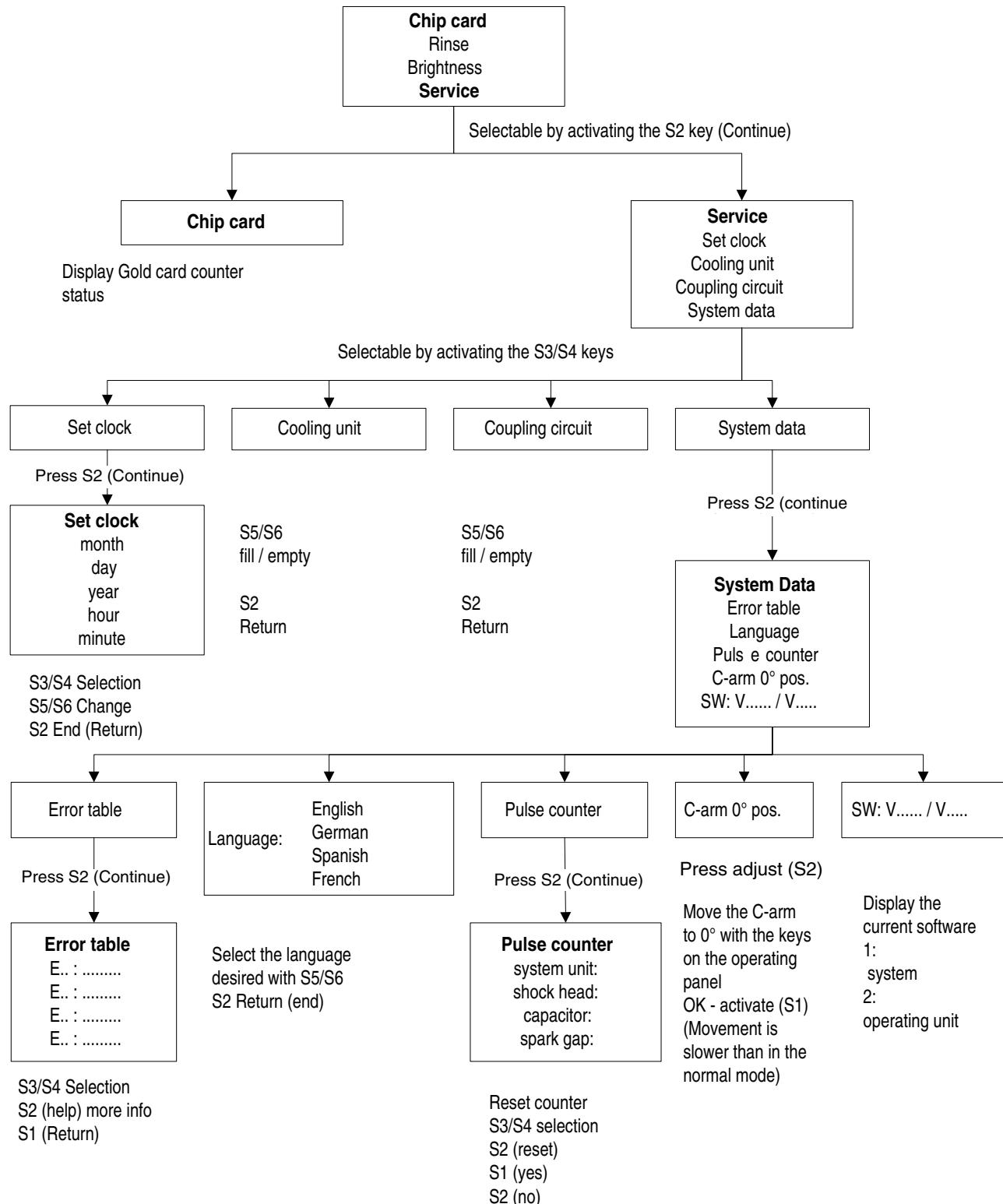


Fig. 4



* with "pay per use" option only

The information in the Service and Chip card menus is displayed in English only



This page intentionally left blank.

LITHOSTAR MODULARIS Parts overview

Assembly		Comments on replacement
Function	Item number	
Shock wave head C	16 11 008	Refer to description Replace the water
Shock wave head C plus	70 41 358	Also replace the M1 pump head Reset the counter to zero SW head C is delivered without the coupling bellow, SW head C plus with coupling bellow
Coupling bellow C	47 78 705	The clamping strap 70 56 823 must be ordered separately!
Coupl. bellow C plus	70 41 416	The clamping strap 70 61 013 must be ordered separately
High voltage cable	11 81 523	Refer to description "cables in corrugated tubing"
High voltage connector	11 81 622	Refer to description
Charging unit	55 31 046	Refer to description
Charging unit HLS	11 58 000	Replaces charging unit with spark gap 55 31 046
Cooling unit	47 78 002	Refer to description Fill in the "dates of start up" field.
Pump	47 73 847 70 41 101	Coupling pump; Refer to description Cooling pump; Refer to description
Temperature sensor	55 31 277	Refer to description "cables in corrugated tubing"
Pressure sensor	55 31 243	Refer to description "cables in corrugated tubing"
Board D3	55 31 053	Refer to description
Battery for board D3	31 46 073	
Control unit	55 31 129	No special instructions required Perform a function test following replacement
Transformer and board D1	55 31 111	Note jumpers for the line voltage 230 V: 3 -5, 200V: 2 - 6, 120 V:1 - 5 and 4 - 7, 100 V: 1 -6 and 2 - 7
Power supply board D1	55 31 301	Check fuses
Angulation motor	55 31 392	Refer to description
MODULARIS support arm	55 31 020	Refer to description
Rotary joint lock	55 31 608	Refer to description
Potentiometer	70 50 433	Refer to description
SIREMOBIL switch	10 70 721	Refer to description
Iso-center phantom	47 78 754	Refer to description

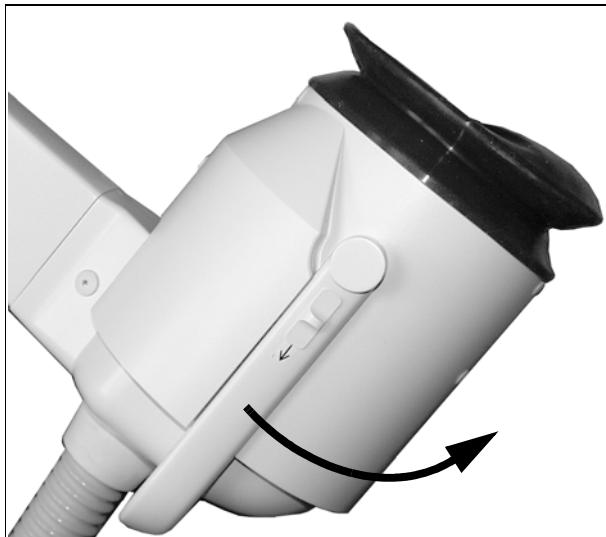


Fig. 1

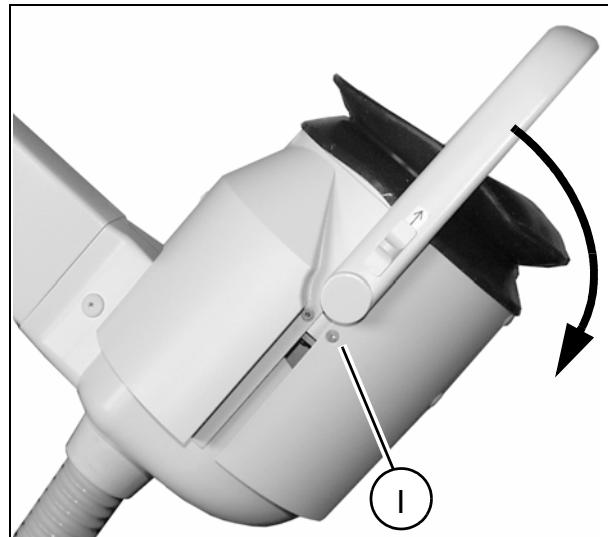


Fig. 2

Shock wave head

Shock wave head covers

- Switch the system off. Remove the covers on the system unit by removing the screws.
- Remove the water reserve tank and drain the remaining water.
- Reinstall the water reserve tank.
- Switch the system on. Position the support arm in the horizontal position.
- Set service switch S2 on board D3 to position 2 (service on).
- Select "service" on the control unit and then "coupling circuit".
- Activate the corresponding key for "empty" (S6) on the control unit until the coupling bellow is located next to the lens.
- Switch the system off.
- Only the equipment with ultrasound localization:
 - Unscrew the two placement parts for the ultrasound.
 - Ensure that the screw lengths are correct when tightening them.
- Remove the mounting screws (I/Fig. 2) for the upper cover on both sides of the shock head.
- Push the buttons in the direction of the arrow on both sides of the iso-center phantom (Fig. 2) and at the same time flip the iso-center phantom back (Fig. 1).
- Detach the upper cover, removing it toward the front.
- Push the buttons on both sides of the iso-center phantom in the direction of the arrow (Fig. 1) and at the same time flip the iso-center phantom up (Fig. 2).
- If required, remove the 3 cover screws from both lower covers and remove the covers.
- Reattach the covers in the reverse order after completion of all work.

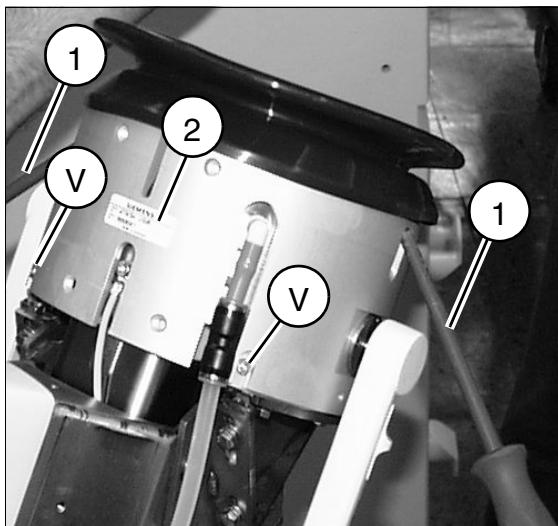


Fig. 3



Fig. 4

Removing the shock wave head

System configuration n = several	1 LITHOSTAR MODULARIS and 1 SIREMOBIL Iso-C	1 LITHOSTAR MODULARIS and n SIREMOBIL Iso-C
Replace shock wave head	<p>To support arm S0050 Adjustment of iso-center on the shock wave head; refer to chapter "Iso-center with X-ray - to support arm serial number 0050".</p> <p>From support arm S0051 Adjustment of iso-center on the SIREMOBIL Iso-C; refer to chapter "Iso-center with X-ray - from support arm serial number 0051".</p>	<p>It is important to follow this workflow to avoid having to readjust the iso-center on all SIREMOBILE!</p> <ul style="list-style-type: none"> Prior to replacing the shock wave head, view the iso-center (the three C-arm positions) and if possible, save it or make a hardcopy. Replace shock wave head. Check iso-center; the setting must be identical to that of the defective shock wave head. If an adjustment is necessary, it must be made via the shock wave head setting; refer to chapter "Iso-center with X-ray - to support arm serial number 0050".

- Remove the covers of the shock wave head (refer to "Shock wave head covers").
- Remove the coupling bellows, carefully pulling the small pin out of the air suction hose inside the coupling bellows (refer also to Fig. 8 and Fig. 9).
- Loosen the four screws (V/Fig. 3) on the iso-center phantom using an Allen key with a guide pin, but do not remove them.
- Flip the iso-center phantom toward the front and **completely remove** it (this may be difficult).
 - If the iso-center phantom has a serial number (2/Fig. 3) it can be removed by using two screw pulleys (1/Fig. 3) on the shock wave head.

- Open valve Y8(Fig. 10, 11),
i.e. switch the Y8 lever from horizontal = closed to vertical = open.
- Switch the system on.
- Set service switch S2 on board D3 to position 2 (service on).
- Select "service" on the control unit and then "cooling unit".
- Activate the corresponding key for "empty" on the control unit until no more water flows out.
- Adjust service switch S2 on board D3 to position 1 (service off).
- Switch the system off.
- Remove the 2 Allen screws (U/Fig. 4) underneath the shock wave head.
- Remove the screw (SL/Fig. 7) with the protective conductor on the shock wave head.
- **Wait at least 10 minutes after switching the system off. Then push the high-voltage connector downward, until the openings (O/Fig. 7) are free.**
- Loosen the Allen screws in the openings (O/Fig. 7) but do not remove them.
- Disconnect all the water hoses at both interfaces of the shock wave head.
- Remove the shock wave head toward the front.

NOTICE

There may be water remaining in the shock wave head.

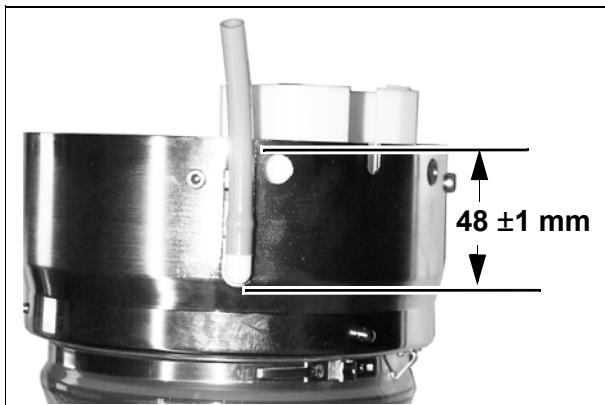


Fig. 5

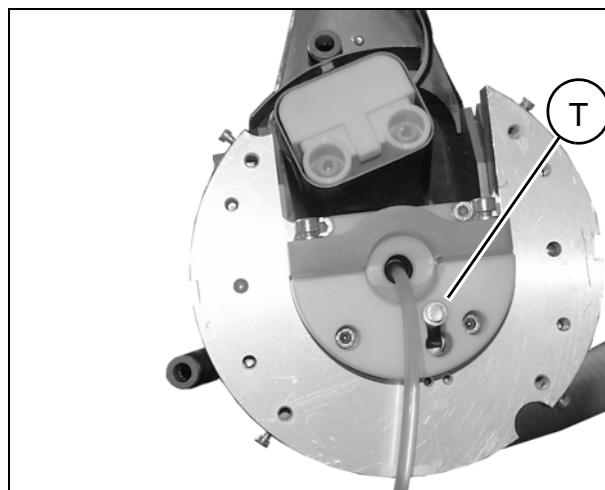


Fig. 6



Fig. 7

Installing the shock wave head

- Shorten both hoses at the shock wave head corresponding to the dimensions in Fig. 5.
- Check that the spring-mounted temperature sensor (T/Fig. 6) is seated correctly in the groove.
- Insert the air suction hose centrally through the shock wave head (L/Fig. 9).
- Install the new shock wave head from above and insert the water hoses; when doing this ensure that **the hose marked in red (R/Fig. 7) is located next to the high-voltage connector and that the air suction hose underneath the shock wave head is neither kinked nor caught in the shock wave head.**
- Attach the shock wave head with the Allen screws (O/Fig. 7) visible through the opening.
- Push the high-voltage plug as far up as possible, until the openings (O/Fig. 7) are covered again.
- Reattach the screw (SL/Fig. 7) with the protective conductor.
- Retighten the 2 Allen screws (U/Fig. 4) underneath the shock wave head.
- Place the iso-center phantom on top so that it is flush and secure it with the four screws (V/Fig. 3) (use an Allen key with a guide pin for this purpose).

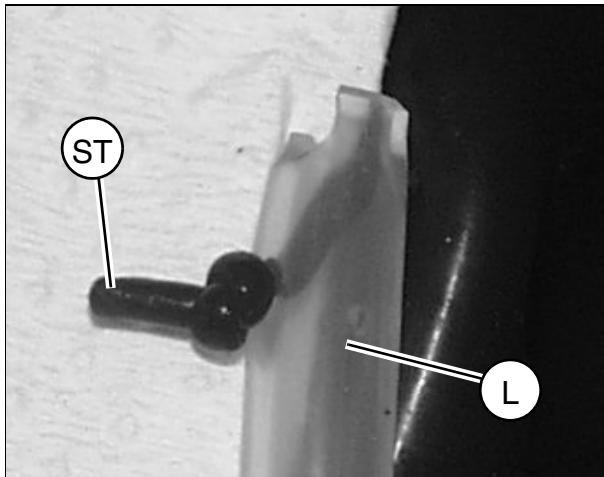


Fig. 8

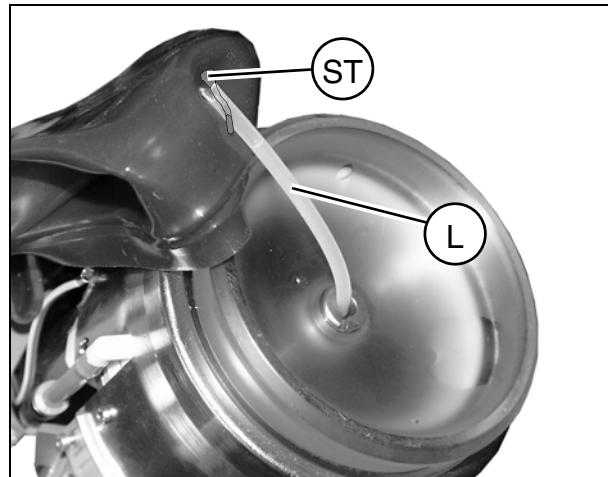


Fig. 9

- Insert the air suction hose (L) as shown in Fig. 8 and Fig. 9 carefully over the pin (ST) in the coupling bellows. Tie a knot to secure it (Fig. 8).
- Install the coupling bellows; when doing this, ensure that the pin (ST/Fig. 9) for attachment of the hose is positioned at the highest point and is seated correctly in the clamp.
- Replace the hose pump head for cooling pump M1 (refer to the section "Hose pump head in the coupling circuit"). (Not necessary if IWAKI pump installed).
- Fill the cooling circuit (refer to the section "Filling the cooling circuit").
- Fill the coupling circuit (refer to the section "Filling the coupling circuit").
- Check the iso-center as described in chapter 5.
- Select "service" and then "coupling circuit" on the control unit.
- Activate the corresponding key for "empty" (S6) on the control unit until the coupling bellows is located next to the lens.
- Reinstall the covers of the shock wave head according to the procedure for removal.
- Adjust service switch S2 on board D3 to position 1 (service off).
- Select "rinse" on the control unit and activate the cycle (ends automatically).
- Read out the counter for the shock wave head and record the value in the operating protocol (in Register 4).
- Reset the counter (refer to chapter 3).
- Connect the service PC to the board as described in chapter 3.
- Read out both temperature values on the service PC; the difference must not exceed a maximum of 3° C.
- Release shock waves: both temperature values should increase closely in parallel ($\Delta T \leq 3^{\circ} C$).
- Reattach the system cover.
- Perform a function test.

Replace isocenter phantom

System configuration n = several	1 LITHOSTAR MODULARIS and 1 SIREMOBIL Iso-C	1 LITHOSTAR MODULARIS and n SIREMOBIL Iso-C
Replace iso-center phantom	<p>To support arm S0050 Adjustment of iso-center on the shock wave head; refer to chapter "Iso-center with X-ray - to support arm serial number 0050".</p> <p>From support arm S0051 Adjustment of iso-center on the SIREMOBIL Iso-C; refer to chapter "Iso-center with X-ray - from support arm serial number 0051".</p>	<p>It is important to follow this workflow to avoid having to readjust the iso-center on all SIREMOBILE!</p> <ul style="list-style-type: none"> • Prior to replacing the iso-center phantom, view the iso-center (the three C-arm positions) and if possible, save it or make a hardcopy. • Replace the iso-center phantom. • Check iso-center; the setting must be identical to that of the defective iso-center phantom. If an adjustment is necessary, it must be made via the shock wave head setting; refer to chapter "Iso-center with X-ray - to support arm serial number 0050".

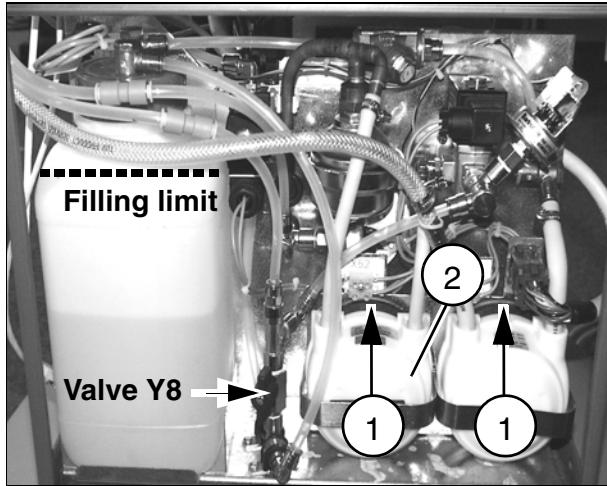


Fig. 10

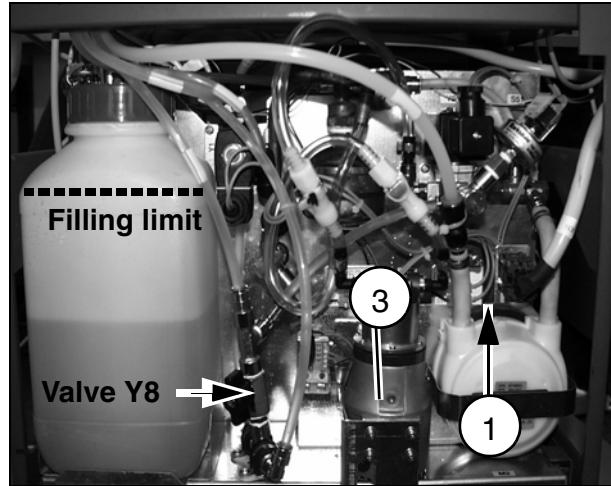


Fig. 11

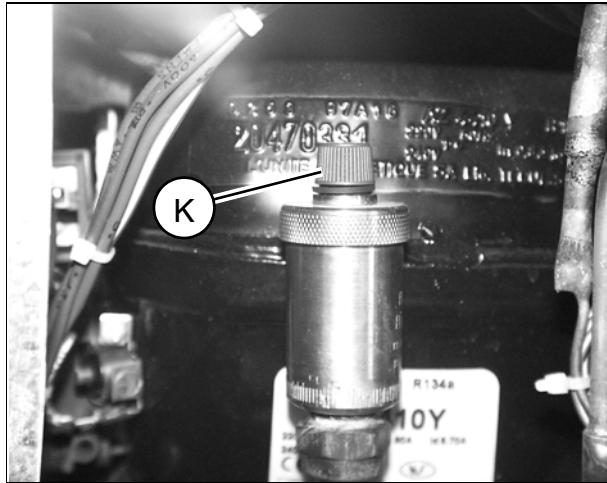


Fig. 12

Cooling unit

Checking the cooling unit

- Disconnect both cables at the temperature switch B1 (located on the cooling unit underneath board D3 and the fiber optic connections).
- Connect both cables together.
- Switch the system on.
- The ventilator and compressor in the cooling unit start up - if not, check the power supply - if o.k., replace cooling unit.
- Switch the system off.
- Reconnect both cables.

Replacing the cooling unit

- Empty the coupling circuit and cooling circuit according to the instructions.
- Replace the cooling unit.
- Fill the coupling circuit and cooling circuit according to the instructions.
- Complete the " Date of start up" field on the cooling unit label.

Filling the cooling circuit

- Remove the system covers.
- Fill the water reserve tank with distilled water.
- Switch the system on.
- Position the support arm in the horizontal position.
- Open the degassing valve (cap K/Fig. 12) in the cooling unit by two turns (it should remain open).
- Adjust service switch S2 on board D3 to position 2 (service on).
- Open valve Y8 (Fig. 10/11),
i.e. switch the Y8 lever from horizontal = closed to vertical = open.
- Select "service" on the control unit and then "cooling unit".
- Activate the corresponding key for "fill" on the control unit until the water flowing from the return line in the water reserve tank is free of air bubbles.
(hose pump M1 will run as long as required, V188 glows on board D3).
- Close valve Y8 (Fig. 10/11);
i.e. switch the Y8 lever from vertical - open to horizontal = closed.
- Adjust service switch S2 on board D3 to position 1 (service off).
- Switch the system off.
- Reattach the system covers.

Filling the coupling circuit

- Remove the system covers.
- Fill the water reserve tank with distilled water, if necessary.
- Switch the system on and position the support arm in the horizontal position
- Adjust service switch S2 on board D3 to position 2 (service on).
- Select "service" on the control unit and then "coupling circuit".
- Activate the corresponding key for "fill" (S6) on the control unit until the coupling bellows rounds out slightly.
- Check whether the air suction hose inside the coupling bellows is actually secured at the topmost position (refer to the section "Installing the shock wave head" and Fig. 8).
- Adjust service switch S2 on board D3 to position 1 (service off).
- Select "rinse" on the control unit and activate the cycle; this function ends automatically.

- If air bubbles are visible in the coupling bellows, start the "rinse" cycle again.
- Switch service switch S2 on board D3 to position 2 (service on).
- Select "service" and then "coupling circuit" on the control unit.
- Activate the corresponding key for "empty" (S6/Fig. 4/page 3-16) on the control unit until the coupling bellows is located next to the lens.
- Switch the system off.
- Fill the water reserve tank up to the fill line (Fig. 10/ 11) with distilled water.
- Set service switch S2 on board D3 to position 1 (service off).
- Switch the system on. The "rinse" cycle will be activated automatically and the coupling bellows will fill.
- Switch the system off.
- Fill the water reserve tank with distilled water.
- Reattach the system covers.

Emptying the cooling circuit with the old pump (2/Fig. 10)

- Remove the system covers.
- Remove the water reserve tank and empty the water.
- Insert the return hose into the water reserve tank.
- Position the support arm in the horizontal position.
- Open valve Y8 (Fig. 10),
i.e. switch the Y8 lever from horizontal = closed to vertical = open.
- Switch the system on.
- Adjust service switch S2 on board D3 to position 2 (service on).
- Select "service" on the control unit and then "cooling unit".
- Activate the corresponding key for "empty" on the control unit until no more water flows.
- Adjust service switch S2 on board D3 to position 1 (service off).
- Switch the system off.

Emptying the cooling circuit with the new pump (3/Fig. 11)

- Remove the system covers from the basic unit.
- Remove the water reserve tank and empty the water.
- Insert the return hose into the water reserve tank.
- Position the support arm in the horizontal position.
- Open valve Y8 (Fig. 11),
i.e. switch the Y8 lever from horizontal = closed to vertical = open.
- Exchange the two water connections on the cooling pump. (The two black-marked hoses are not connected).
- Switch the system on.
- Set service switch S2 on board D3 to position 2 (service on).
- Select "service" and then "cooling unit" on the control unit.
- Activate the corresponding key for "empty" on the control unit until the water stops.
- Set service switch S2 on board D3 to position 2 (service off).
- Switch the system off.
- Properly connect the two water connections to the cooling pump. (Both black-marked hoses must be reconnected).

Emptying the coupling circuit

- Remove the system covers on the basic unit.
- Remove the water reserve tank and empty the water.
- Switch the system on.
- Position the support arm in the horizontal position.
- Set service switch S2 on board D3 to position 2 (service on).
- Select "service" and then "coupling circuit" on the control unit.
- Activate the corresponding key for "empty" (S6/Fig. 4/ page 3-16) on the control unit until the coupling bellows is located next to the lens.
- Switch the system off.

Hose pump head in the coupling circuit

Removing the hose pump head

- Remove the system cover and the cover of the shock wave head.
- Empty the coupling circuit (refer to the section "Emptying the coupling circuit").
- Switch the system off.
- Remove the safety latch on the hose pump head.
- Press the black lock (1/Fig. 10/11) upward or downward and remove the hose pump head from the drive.
- Open the 2 hose clamps and remove the hoses.
- Remove the hose pump head.

Installing the hose pump head

- Place the hose pump head on the drive shaft and lock into place.
- Reconnect the 2 hoses with the hose clamps.
Ensure that the hoses are the correct length, i.e. cut them to the same length as the old hoses.
- Fill the coupling circuit (refer to "Filling the coupling circuit").

Hose pump head in the cooling circuit

Removing the hose pump head

- Switch the system off.
- Open the system cover.
- Empty the cooling circuit (refer to the section "Emptying the cooling circuit").
- Remove the safety latch on the hose pump head.
- Press the black lock (1/Fig. 10) downward or upward and remove the hose pump head from the drive.
- Open the 2 hose clamps and disconnect the hoses.
- Remove the hose pump head.

Installing the hose pump head

- Place the hose pump head on the drive shaft and lock into position.
- Reconnect the 2 hoses with the hose clamps.
Ensure that the hoses are the correct length, i.e. cut them to the same length as the old hoses.
- Fill the cooling circuit (refer to the section "Filling the cooling circuit").

IWAKI cooling pump

Removal

- Switch the system off.
- Open the system cover.
- Remove the fasteners on the pump.
- Remove the motor connections on the terminal block.
- Loosen the screws to remove the pump.

Installation

- Tighten the pump.
- Connect the motor connections.
- Connect the fasteners on the pump (The black-marked water hoses must be connected).
- Fill the cooling circuit (refer to the section "Filling the cooling circuit").

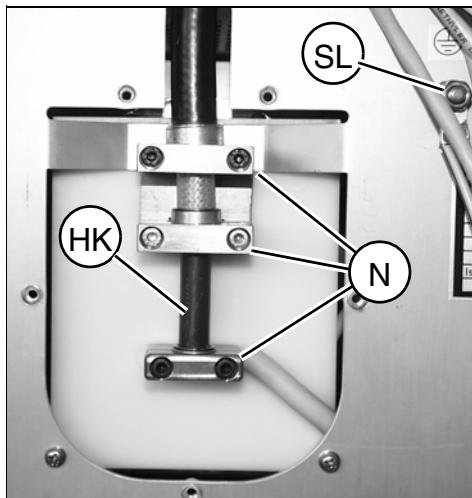


Fig. 13

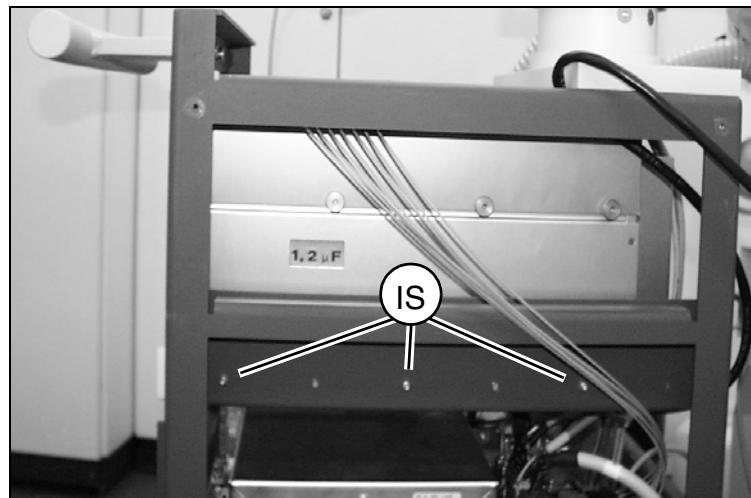


Fig. 14

Charging unit

NOTICE

**The charging unit should not be opened again.
If a charging unit with spark gap is replaced by a charging unit with semiconductor switch (11 58 000), then the software VA00J must be used.**

- Switch the system off, disconnect the power plug.
- Remove the covers (of the basic system unit), disconnect the charging unit power cable.
- **Wait at least 10 minutes after switching the system off. Then remove the cover on the back high-voltage cable connection (Fig. 13).**
- Remove the high voltage cable (HK/Fig. 13) and the protective conductor (SL/Fig. 13) by removing the screws.
- Remove the fiber optic cable from the charging unit.
- Remove the six Allen screws (IS/Fig. 14) (three on each side, right and left).
- Remove the old charging unit from the basic system unit and install the new one.
- Reattach the six Allen screws (IS/Fig. 14) and tighten them (three on each side, right and left).
- Reconnect the fiber optic cable to the charging unit (check for correct connections).
- Reattach the protective conductor and the high-voltage cable with the screws (Fig. 13).
- Reattach the cover on the high-voltage cable connection.
- Reconnect the power cable of the charging unit.
- Record the installation date on the charging unit (next to the capacitor).
- Switch the system on, read out the counters for the charging unit and the spark gap and record the values on the **old** charging unit. Reset the counter (refer to chapter 3).
- Perform a function test.
- Switch the system off and reattach the system cover.

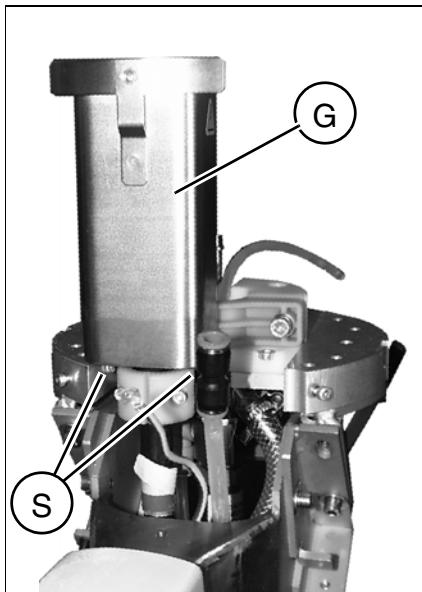


Fig. 15

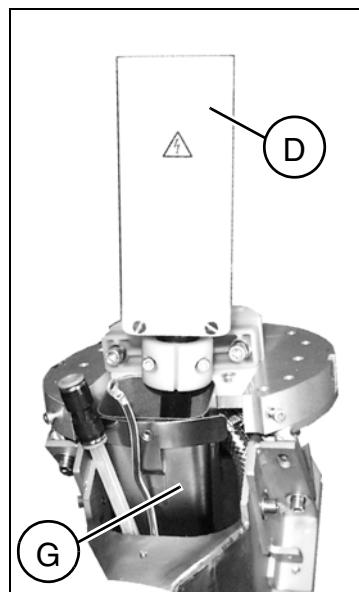


Fig. 16

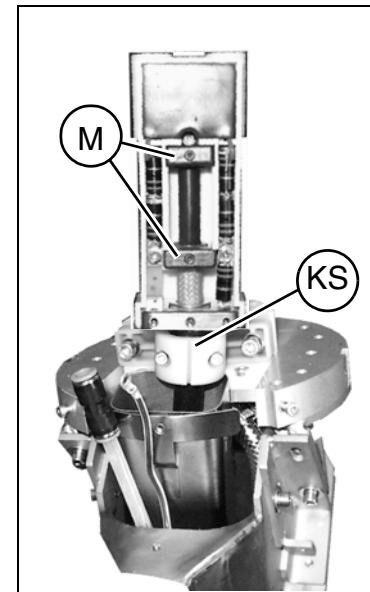


Fig. 17

High voltage connector

- Remove the covers of the basic system unit and the shock wave head.
- Remove the shock wave head (refer to the corresponding section).
- Remove the cover at the charging unit above the high-voltage connection by removing the screws (Fig. 13).
- Remove the three clamps (N/Fig. 13) on the high-voltage connection.
- Push the high voltage cable (HK/Fig. 16) in the direction of the shock wave head through the corrugated tubing until the high-voltage connector is accessible (Fig. 15).
- Remove the screws (S/Fig. 15) on the high voltage connector.
- Push the metal housing (G/Fig. 16) above the high-voltage plug toward the back.
- Open the cover (D/Fig. 16) of the high-voltage connector.
- Remove the connection clamps (M/Fig. 17) in the old high-voltage connector.
- Open the cable clamps (KS/Fig. 17) of the high-voltage connector.
- Connect the new high-voltage connector; reconnect and secure it in the reverse order of the removal.
- Push the high-voltage cable back in the direction of the charging unit (in the basic unit) and connect it (Fig. 13).
- Mount the shock wave head assembly (refer to the corresponding section).
- Attach all covers (refer to the corresponding sections).

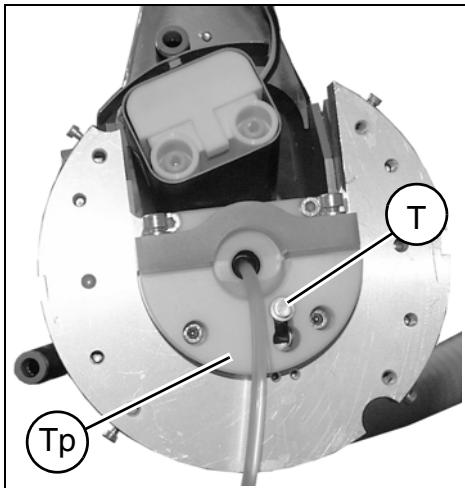


Fig. 18

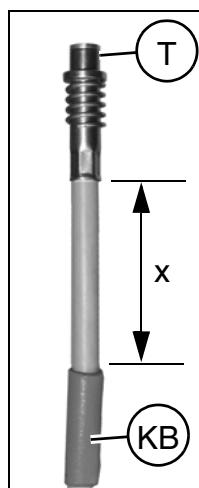


Fig. 19

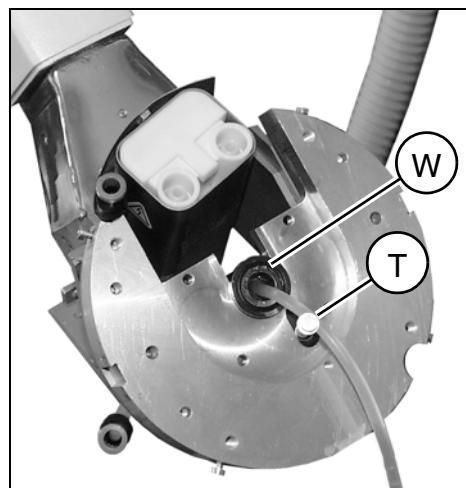


Fig. 20

Cables in the corrugated tubing

NOTICE

All cables must be disconnected from the shock wave head in order to replace parts of the corrugated tubing.

- Remove the covers on the basic system unit and the shock wave head.
- Remove the shock wave head (refer to the corresponding section).
- Push the temperature sensor slightly forward (T/Fig. 18) in the shock wave head support and then push it back to the side.
- Secure the spiral spring to the sensor supply cable approx. 4 cm (x/Fig. 19) behind the temperature sensor with adhesive tape to keep it from slipping back (KB/Fig. 19).
- **To support arm serial number 0050**
 - Remove the white teflon plate (Tp/Fig. 18) by removing the screws.
 - Now pull the water supply (W/Fig. 20) in the shock wave head somewhat forward and then push it back to the side.
- **From support arm serial number 0051**
 - Remove the two screws (1/Fig. 21).
 - Remove the lower part (2/Fig. 21).
 - Remove the column cover (Fig. 23).
 - Do not cut open the cable that fastens the corrugated tubing to the support arm. It can be opened with a small movement of the screw.
 - Unscrew the corrugated tubing (2/Fig. 23).
 - Remove the disk (3/Fig. 24) from the corrugated tubing.
 - Replace the corresponding cable in the corrugated tubing.
 - If the "temperature sensor" cable is being replaced, the water supply from the defective one must be transferred to the new pressure sensor (for more information on this procedure, refer to the section "Air suction hose").

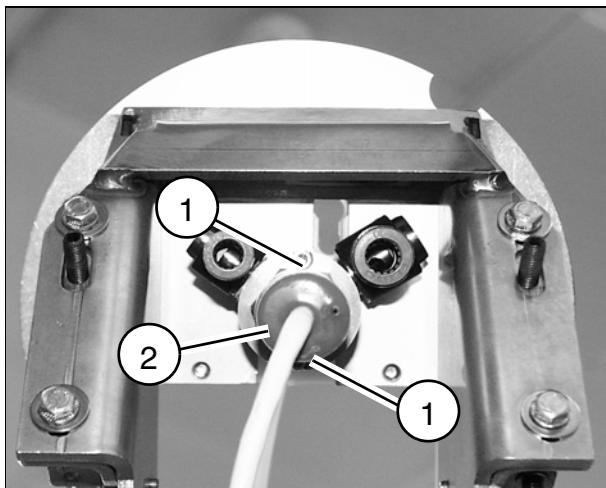


Fig. 21

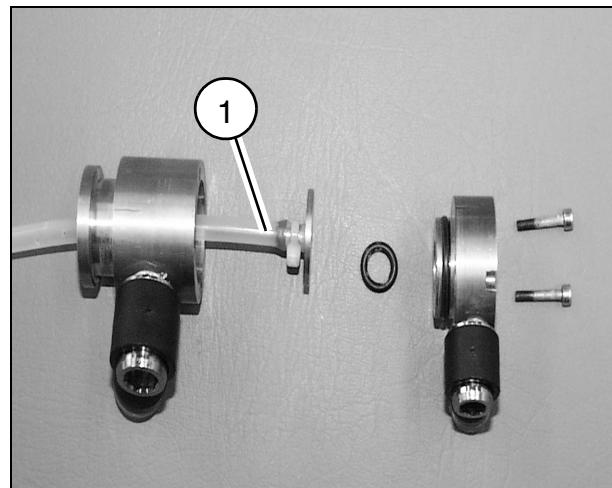


Fig. 22

- **To support arm serial number 0050**

- Place the water supply (W/Fig. 20) in the shock wave head in the same manner it was done during deinstallation.
 - Reattach the white teflon plate (Tp/Fig. 18).

- **From support arm serial number 0051**

- Reattach the lower part (2/Fig. 21).
 - Tighten the two screws (1/Fig. 21).
- Place the temperature sensor (T/Fig. 18) with the spiral spring from the back in the shock wave head in the same manner it was done during deinstallation; ensure that the spiral force of the spring pushes the temperature sensor to the front (Fig. 18).
- Reattach the disk (3/Fig. 24) to the corrugated tubing, make sure the leads are correctly attached.
 - High voltage cable (4/Fig. 24)
 - Tubing sections (5/Fig. 24)
 - Other lead (6/Fig. 24).
- Reattach the corrugated tubing with the screws.
- Route the cables and the hoses according to Fig. 24.
- Reattach the column cover.
- Mount the shock wave head assembly (refer to the corresponding section).
- Reattach all covers (refer to the corresponding section).

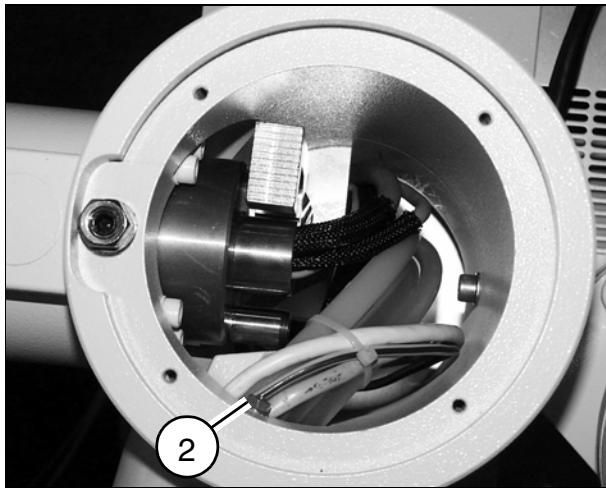


Fig. 23

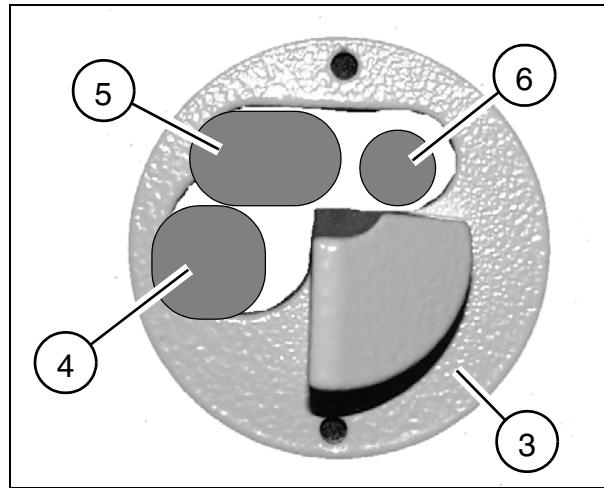


Fig. 24

Air suction hose

To support arm serial number 0050

- Remove the covers of the basic system unit and the shock wave head.
- Remove the shock wave head (refer to the corresponding section).
- Pull the temperature sensor (T/Fig. 18) in the shock wave head support somewhat forward and then push it back through to the side.
- Secure the spiral spring to the sensor supply cable (x/Fig. 19) approx. 4 cm behind the temperature sensor with adhesive tape (KB/Fig. 19) to keep it from slipping back.
- Remove the white teflon plate (Tp/Fig. 18) by removing the screws.
- Push the high-voltage connector (W/Fig. 20) slightly to the side for better access to the water supply (Fig. 20).
- Now pull the water supply (W/Fig. 20) with the center air suction hose slightly forward in the shock wave head support and then push it back through to the side.
- Remove the front bracket connection (F/Fig. 25) on the water supply by removing the screws.
- Remove the front part (E/Fig. 25) of the water supply by removing the screws.
- Disconnect the old water hose.
- Install the new water hose and secure it with the appropriate hardware.
- Remove the front part (E/Fig. 25) of the water supply by removing the screws.
- Puncture the tubing with a needle (app. 1 mm) twice at this point (</Fig. 25).
- Insulate the bracket connection of the water supply (F/Fig. 25) just removed, i.e. attach new teflon insulation tape with the screws; when doing this do not block the opening to the pressure sensor.

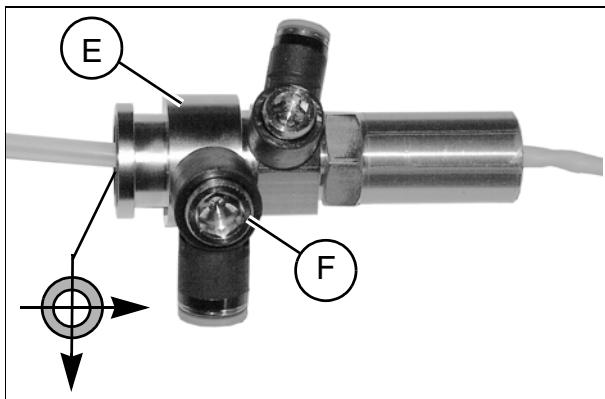


Fig. 25

- Install the water supply (W/Fig. 20) in the shock wave head support, following the same procedure as for removal.
- Reinstall the white teflon plate (Tp/Fig. 18).
- Install the temperature sensor (T/Fig.20) with the spiral spring in the shock wave head support following the same procedure as for removal in the reverse order; when doing this, make sure that the spring force of the spiral spring is pushing forward against the temperature sensor (Fig. 18).
- Install the shock wave head assembly (refer to the corresponding section).
- Reattach all covers (refer to the corresponding section).

From support arm serial number 0051

- Remove the covers of the basic system unit and the shock wave head.
- Empty the coupling circuit (refer to specific paragraph).
- Remove the coupling bellows.
- Remove both screws (1/Fig. 21).
- Pull out the lower part (2/Fig. 21).
- Remove the part with the air suction hose (1/Fig. 22).
- Replace the air suction hose.
- Pierce the hose two times with a needle (approx. 1mm) in the same manner the old hose was pierced.
- Reassemble in the opposite order. Ensure proper position of the Allen screws during reassembly.

Board D3 or Chip card reader

Notice for LITHOSTAR MODULARIS with the Gold card:

- Do not use the Gold card to troubleshoot other systems!
- Changing the Gold card too many times will render it unusable.
- After each change of the Gold card to another system, the user must confirm this on the control unit.
- The Gold card and the board each contain an internal counter; if these counters do not have the same value, the counter values will increase.
- If the card must be changed due to service, the switch on board D3 must be set to service prior to beginning the service work. In this case, the counter values will not change. However, shock wave release will be blocked but the system will initialize.
- If D3/M13 is being replaced, an internal counter on the Gold card will count up. The Gold card will be automatically rendered unusable if the Init counter in the "Chip Card" menu exceeds "3".
- A new Gold card must be ordered from the sales department.
After receiving the new Gold card, the old card **must** be returned to SPL in Erlangen. If the card is not returned, full price will be charged.

Replacing board D3

- Prior to installing a new board, if possible, read out the counter status and record the value in the operating protocol (register protocol).
- Prior to removing board D3, remove the chip card (Gold card or pay-per-use) from the reader.
 - For Gold card only:
Prior to ejecting the card, remove the reader from the covers by removing the screws (the insertion slot must be clear).
 - Eject:
Set switch on board D3 to service mode.
In the service menu, select chip card and eject.
- Switch the system off. Replace board D3. Prior to installing the board, check whether the battery is connected.
- If the ultrasound localization is available, assemble the D3 board on the new ultrasound addition.
- Switch the system on.
- Connect the service PC and then connect to the LITHOSTAR MODULARIS. Perform a software download (refer to chapter 3).
- Perform system-specific settings:
time, language, table right or left, pulse rate, ECG triggering.
- Reset switch S2 on board D3 to normal mode.
- Turn system off and then on again.

- Depending on the language selected, the following text will appear on the control display panel of the LITHOSTAR MODULARIS:
 - "Bitte eine LITHOCARD einlegen!"
 - "Please insert a LITHOCARD!"
 - "Introducir una LITHOCARD!"
 - "Veuillez insérer une LITHOCARD!"
- Insert a "pay per use" card or a "gold card"
 - ⇒ If a gold card is inserted, the following - text is displayed: "New LITHOCARD Gold" inside! Increment INIT-Counter? - Answer "Yes" to this question.
- For Gold card only: mount the chip card reader.
- If the ultrasound localization is available, the potentiometer will have to be adjusted accordingly (see chapter on "Service software", select option: u).
- Check if the default values for ultrasound are available (SPL1-130.038.01...) and whether any necessary changes were made.

Board D3 Addition (Ultrasound)

If the ultrasound addition is being replaced, the potentiometer will have to be adjusted accordingly (see chapter on "Service software", select option: u).

Pressure measurement

NOTE

Coupling bellows (C-system), item number 16 12 337 must be used in order to perform the pressure measurement.

To guarantee a constant energy output, pressure measurements must be performed after working on the shock wave system. In the case of statements of the operating staff about deviating pressure values, the current values must be compared with the originally measured values before replacing the shock wave head.

- Switch the system off.
- Remove the covers of the shock wave head (refer to the corresponding section).
- Remove the coupling bellows; when doing this, carefully pull the guide pin out of the air suction hose (Fig. 8 and Fig. 9).
- Loosen the four screws (V/Fig. 3) on the iso-center phantom but do not remove them.
- Flip the iso-center phantom forward and remove it completely.
- Mount the C-system coupling bellows for the pressure measurement.
- Fill the coupling circuit (refer to the corresponding sections).
- Remove any air bubbles in the coupling bellows. Install the adapter for the pressure measurement.
- Perform the pressure measurement according to instruction SPL1-120.074.01.
- The instructions for performing the pressure measurement are delivered with the shock wave pressure test device (PTU).
- After completing the pressure measurement, restore the system to its previous status.

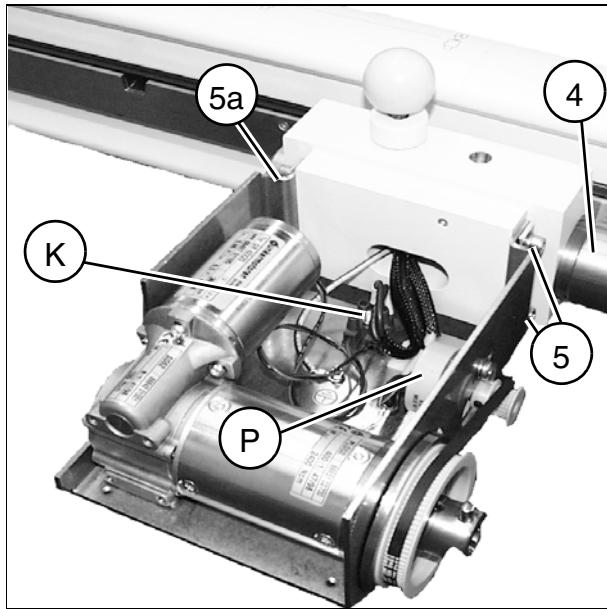


Fig. 26

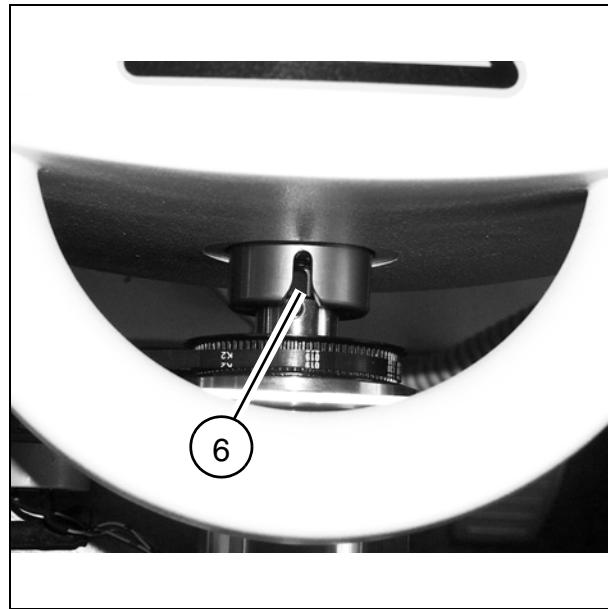


Fig. 27

Potentiometer for angulation drive

- Couple the LITHOSTAR MODULARIS to the SIREMOBIL Iso-C.
- Adjust the C-arm to 0°.
- Open the cover of the angulation drive (Fig. 26).
- Desolder the cables at the potentiometer (P/Fig. 26); when doing this, record the color coding of the cables to the potentiometer connections to ensure correct reconnection.
- Remove the old potentiometer completely (P/Fig. 26).
- Install and solder the new potentiometer.
- Set the potentiometer to 500 ± 10 ohms or 5.0 ± 0.1 volts (center position).
The potentiometer setting can also be checked with the Service PV (Chapter 3).
- Tighten the toothed belt.
- Perform C-arm adjustment as described on page 3- 10.
- Reattach the covers.

Angulation drive (C-arm drive)

- Open the cover of the angulation drive.
- Disconnect the motor cable coming from the unit at the clamp (K/Fig. 26).
- Desolder the cables at the potentiometer (P/Fig. 26); when doing this, record the color coding of the cables to the potentiometer connections to ensure correct reconnection.
- Remove the old angulation drive completely.
- Install the new angulation drive. Do not tighten the mounting screws yet (5/5a/Fig. 26).
- Adjust the C-arm to 0°.
- Couple the LITHOSTAR MODULARIS to the SIREMOBIL Iso -C.
 - The pin (6/Fig. 27) should go easily into the guide; if not, rotate the motor via the control panel of the LITHOSTAR MODULARIS.
 - The screws can still be loosened (5/5a/Fig. 26). Follow the correct sequence when tightening (5 up, 5 down, 5a up, 5a down/ Fig. 26).
- Set the potentiometer to 500 ± 10 ohms or 5.0 ± 0.1 volts (center position).
The potentiometer setting can also be checked with the Service PV (Chapter 3).
- Tighten the toothed belt.
- Adjust the C-arm according to the description on pages 3 - 10.
- Reattach the motor cover.

SIREMOBIL Iso-C switch

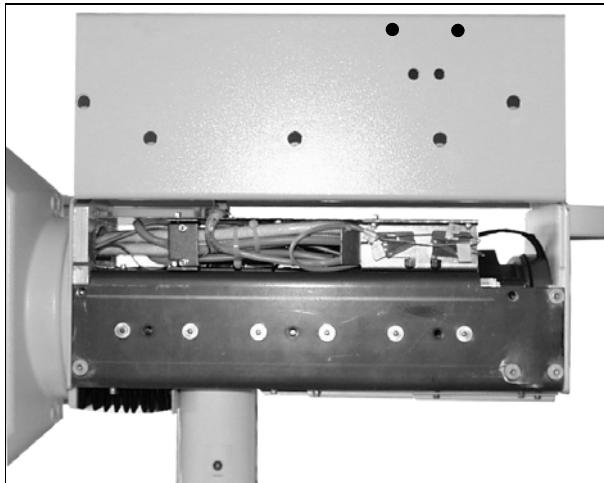


Fig. 28

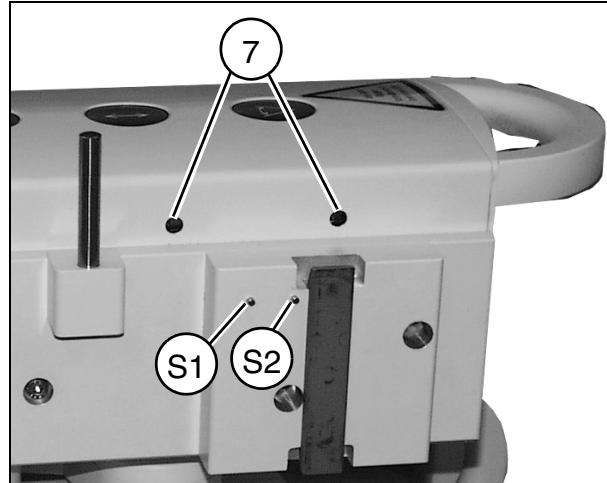


Fig. 29

System configuration n = several	1 LITHOSTAR MODULARIS and 1 SIREMOBIL Iso-C	1 LITHOSTAR MODULARIS and n SIREMOBIL Iso-C
Remove docking plate	<p>To support arm S0050 Adjustment of iso-center on the shock wave head; refer to chapter "Iso-center with X-ray - to support arm serial number 0050."</p> <p>From support arm S0051 Adjustment of iso-center on the SIREMOBIL Iso-C; refer to chapter "Iso-center with X-ray - from support arm serial number 0051."</p>	<p>It is important to follow this workflow to avoid having to readjust the iso-center on all SIREMOBILE!</p> <ul style="list-style-type: none"> Prior to removing the docking plate, view the iso-center (the three C-arm positions) and if possible, save it or make a hardcopy. Remove the docking plate (mark the position on the SIREMOBIL Iso-C). Perform the necessary work on the SIREMOBIL Iso-C. Tighten the docking plate back into place. Check iso-center; the setting must be identical to how it was prior to removing the docking plate. If an adjustment is necessary, it must be made via the iso-center setting on the SIREMOBIL Iso-C; refer to chapter "Iso-center with X-ray - from support arm serial number 0051."

NOTICE**Damage of docking plate.**

The lift switch-off in the SIREMOBIL Iso-C may not switch off if the floor is not level. If this is the case, make use of the additional steering castors (see also Operating Instructions).

Replacing switches

NOTICE

If the docking plate was removed, the iso-center must be checked.

- Remove the docking plate by removing the screws.
- Remove the horizontal carriage cover of the SIREMOBIL:
 - to do this, remove the six screws on the underside,
 - expand the cover slightly and push it up (Fig. 28).
- Replace the switch.
- Reattach the horizontal carriage cover to the SIREMOBIL with the screws.
- **To support arm serial number 0050**
 - Reattach the docking plate so that it is seated on the threads of the screws. Tighten the mounting screws with a torque of 18 Nm.
- **From support arm serial number 0051**
 - Tighten the plate (9/Fig. 29) with a torque of 18 Nm.
 - Tighten the plate (8/Fig. 29) with a torque of 10 Nm.

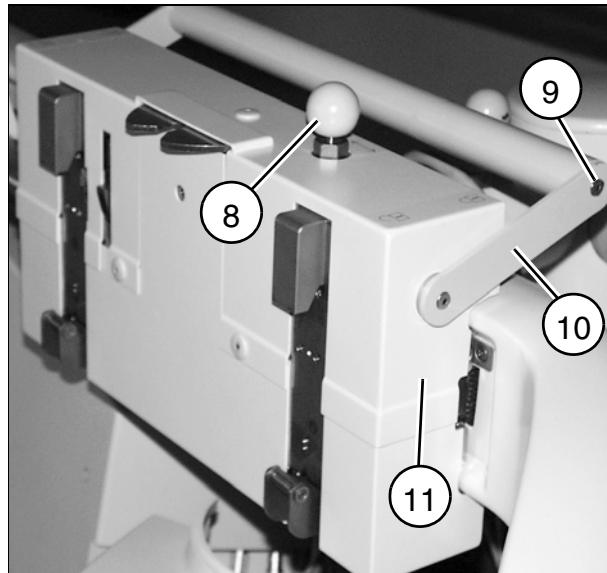


Fig. 30

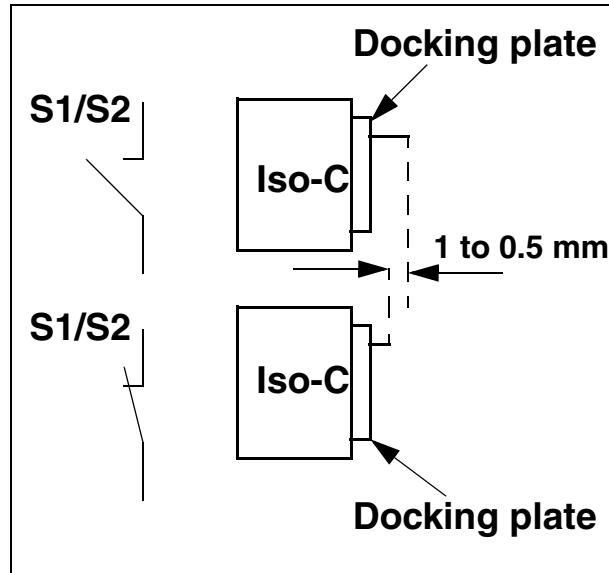


Fig. 31

Adjusting switches S1/S2

- Adjustment of activating lever (Fig. 31).
- When activating pin S1 (Fig. 29), the travel movement of the vertical column is blocked.
- When activating pin S2 (Fig. 29), both movement directions of the vertical column are blocked.
- The screws behind the opening (7/Fig. 29) should be loosened only. Move switch until switching function is activated and tighten screws.

Setting the cam on the LITHOSTAR MODULARIS

NOTICE

Only necessary if the switch on the SIREMOBIL Iso-C cannot be adjusted.

- Remove the knob (8/Fig. 30); lift up the ball and secure the axis from shifting.
- **To support arm serial number 0050**
 - Remove the countersunk screw (9/Fig. 30).
 - Remove all screws from the covers.
 - Firmly pull the handle apart (10/Fig. 30).



Fig. 32

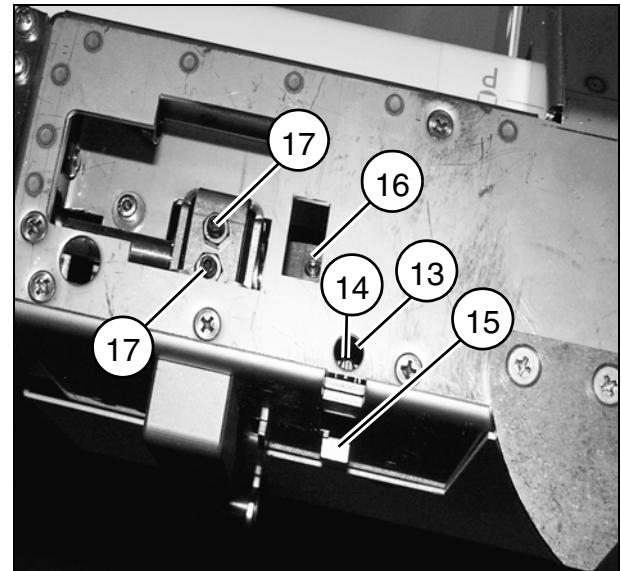


Fig. 33

- **From support arm serial number 0051**
 - Remove all cover screws.
- Remove upper portion of covers (11/Fig. 30).
- Couple the LITHOSTAR MODULARIS to the SIREMOBIL Iso-C.
- Raise the vertical column of the SIREMOBIL Iso-C until the LITHOSTAR MODULARIS hooks onto the docking plate of the SIREMOBIL Iso-C (12/Fig. 32).
- Loosen the lock nut (13/Fig. 33).
- Rotate the threaded nut (14/Fig. 33) to adjust the cam (15/Fig. 33) so that the switch is rotated. Upward movement of the SIREMOBIL Iso-C is blocked.
- Tighten the lock nut (13/Fig. 33).
- Temporarily attach the braking handle.
- Lock the LITHOSTAR MODULARIS and the SIREMOBIL Iso-C together.
- Downward movement must be blocked.
If not:
 - loosen the set screw (16/Fig. 33).
 - rotate the lever until the switch is activated.
 - tighten the set screw (16/Fig. 33).
- Reattach the covers.

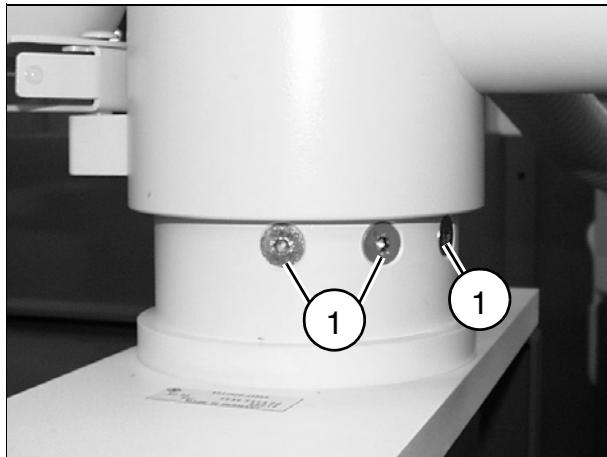


Fig. 34

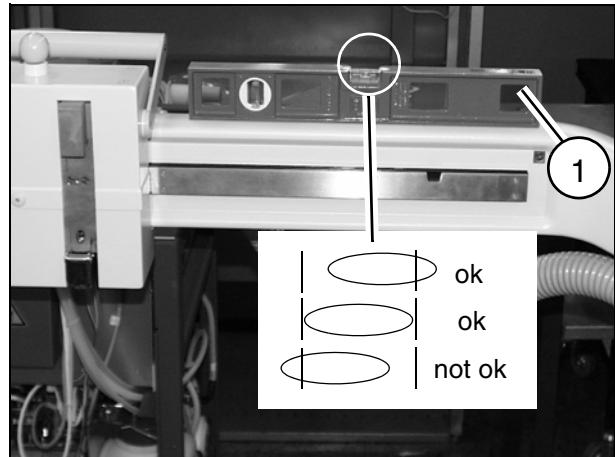


Fig. 35

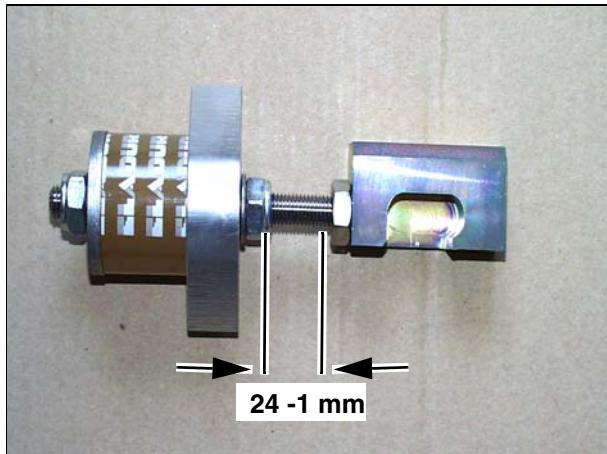


Fig. 36

Balancing Spring for the Support Arm

- Position the support arm vertically.
- Remove covers from the cart.
- Remove the cover from the column/mount for the ECG triggering.
- Remove the cover from the high voltage connector on the charge device (this simplifies removing the spring mount).
- Remove the 3 screws (1/Fig. 34). Take out the spring mount.
- Remove the spring mount.
- Replace the balancing spring.
 - If the mount is different from the ones delivered, it must be replaced as well.
 - Be sure to have correct spacing (Fig. 36).
- Reinstall the spring mount.

- Perform the following check:
 - position the support arm horizontally and place it in the docking position (center locking position).
 - place a level on the support arm (1/Fig. 35).
 - the air bubble can point to the right, but **not to the left** (Fig. 35). If the air bubble moves to the left side, the spring must be replaced.
- Check the iso-center with radiation.



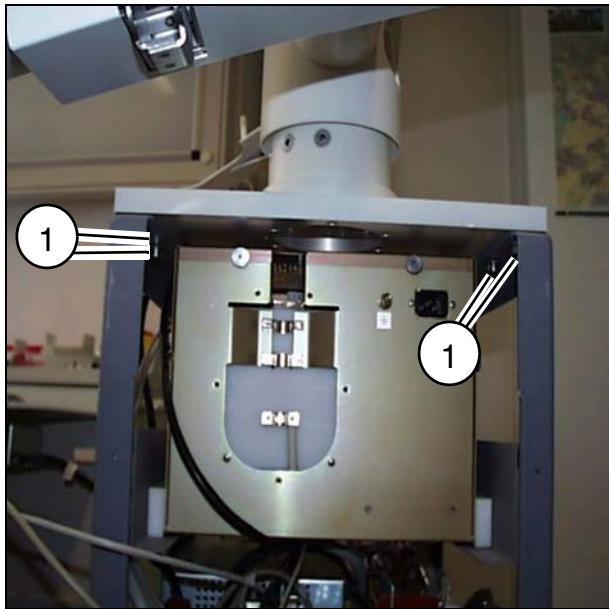


Fig. 37

Support arm replacement

- Remove the system covers and the covers of the shock wave head.
- Empty the coupling circuit (refer to "Emptying the coupling circuit" section).
- Empty the cooling circuit (refer to "Emptying the cooling circuit" section).
- Switch the unit off and disconnect it from the power supply.
- Dismantle the shock wave head (refer to page 4-3).
- Remove the residual water from the hoses.
- If the ECG triggering option is available, remove Sirecust from docking station and unscrew this.
- Open the charging unit and disconnect the high-voltage connection (refer to page 4-14).
- Disconnect all cables and hoses in the unit coming out from the corrugated hose.
- Unscrew the corrugated hose (2/Fig. 23).

Remove cables and hoses from the rotary joint.

NOTE

2 persons are required temporarily to replace the support arm.

- Loosen 4 screws of the support arm mounting (1/Fig. 37).
- Remove the old support arm and position the new one.
- Tighten the 4 mounting screws (1/Fig. 37) with 20 Nm torque.
- Push cables and hoses through the opening of the rotary joint and run them downwards. Refer to Fig. 23 for the cable run. Fasten the corrugated hose to the rotary joint (2/Fig. 23).

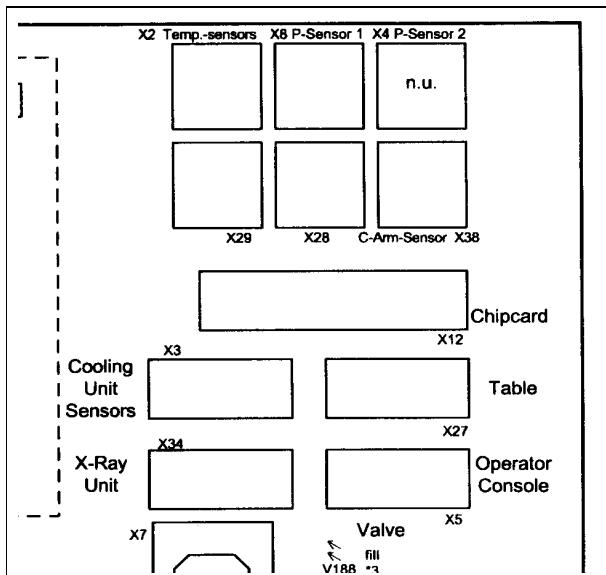


Fig. 38

- Check and correct if necessary the cable run in all positions of the support arm.
- Plug in or fasten cables and hoses again according to designation.
Refer to Fig. 38 for plug designations on board D3.
- Install the water supply delivered with the support arm (refer to page 4-18).
- Install the shock wave head completely (refer to page 4-5).
- If the ECG triggering option is available, draw the trigger cable and cable for Sirecust power supply upwards through the rotary joint.
- Strain-relieve the cable on the docking station and install docking station.
- Fill cooling circuit and coupling circuit (refer to page 4-9).
- Adjustment of the lift switch-off (see page 4-26 (Fig. 30/31)).
- Adjustment of the clamping
 - For docking plate serial number ≤ 0050
Turn in the screws (see page 4-27 (17/Fig. 33)) on both clamping hooks symmetrically until the correct clamping force is reached. Then lock the screws again.
 - For docking plate serial number ≥ 0051
(see Installation and Setting Instructions SPL 1-130.033.01 page 4-2).
- Adjustment of the angulation motor (see page 4-23).
- Check shot triggering and centering.
- Attach all cover parts.

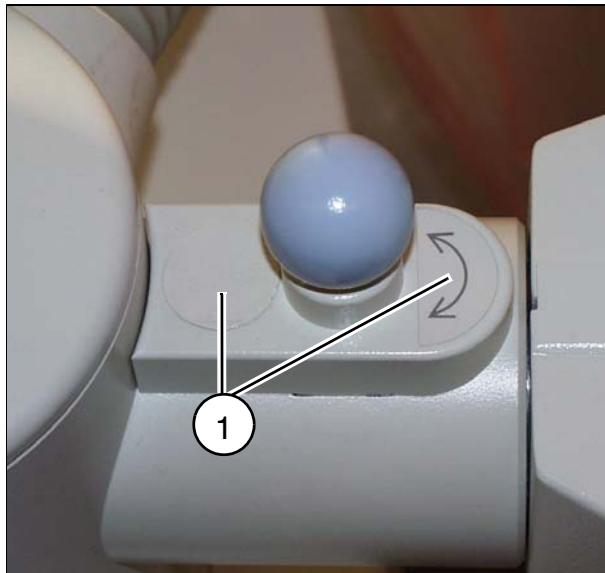


Fig. 39

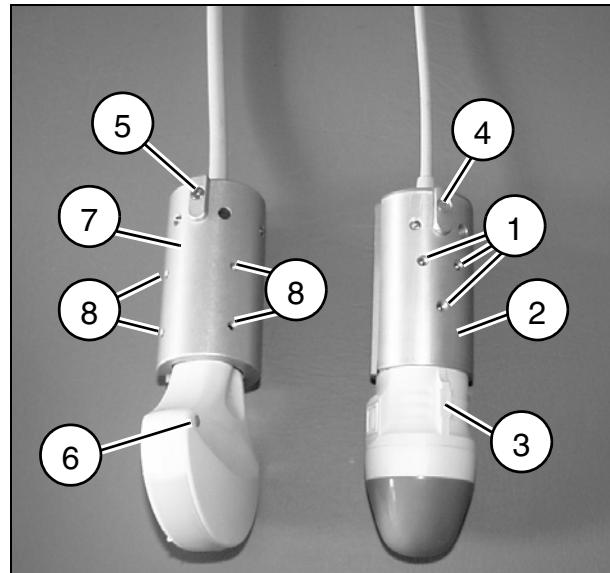


Fig. 40

Replacement of rotary joint lock

- Remove the two labels (1/Fig. 39).
- Loosen the screws located below and remove the rotary joint lock.
- Loosen the brake screw.
- Pull out the arm with the shaft (2 men).
- Remove any burr which may be present on the catch holes.
- Replace brake pad.
- Reinsert shaft.
- Fasten the new rotary joint lock.
- Tighten and counter brake screw. (The support arm must not move out of the vertical position on its own).
- Affix the labels again.
- Check the lock in all positions.

Replacing the probe

Sector Probe

- Loosen the 6 screws (3 are not visible) (1/Fig. 40) and remove the sleeve (2/Fig. 40).
- Attach the sleeve on the new probe. Pay particular attention to the positioning, the marking (3/Fig. 40) and (4/Fig. 40) must form a line.
- Tighten the 6 screws.
- Check the ultrasound iso-center.

Curved Probe

- Loosen the 8 screws (4 are not visible) (8/Fig. 40) and remove the sleeve (7/Fig. 40).
- Attach the sleeve on the new probe. Pay particular attention to the positioning, the narrow side with the orange dot (6/Fig. 40) and (5/Fig. 40) must form a line.
- Tighten the 8 screws.
- Check the ultrasound iso-center.

Concluding work

- Perform the protective conductor measurement.
- Test all functions from the control panel.

This page intentionally left blank.

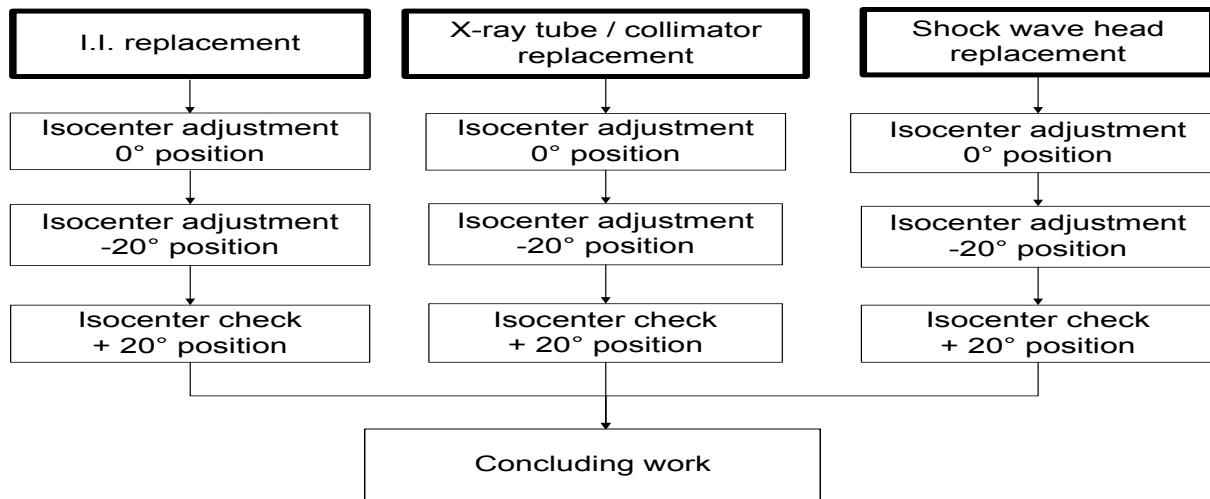
LITHOSTAR MODULARIS to support arm serial number 0050

NOTICE

The ball will jump when zooming, but this has no effect.

Adjustment procedure

Prerequisite: The potentiometer must be correctly adjusted on the motor.



If screws were loosened on the adjustment direction of the shock wave head they must be tightened before checking the iso-center with X-ray.

NOTICE

Before the iso-center can be checked or adjusted, the following settings must be performed on the SIREMOBIL Iso-C:

1. Camera rotation to 0°.
2. Deselect image reverse vertical (LED is off).
3. Deselect image reverse horizontal (LED off).

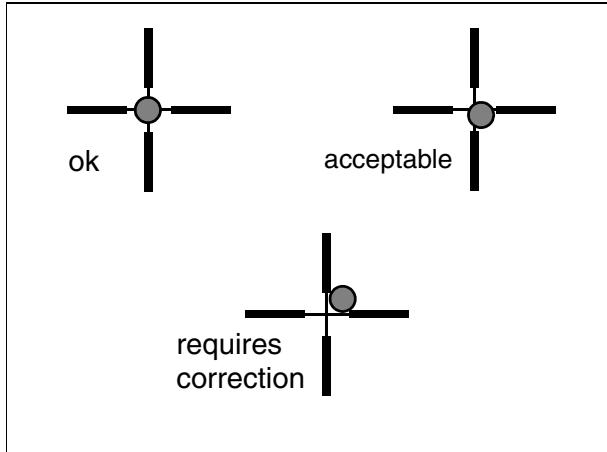


Fig. 1

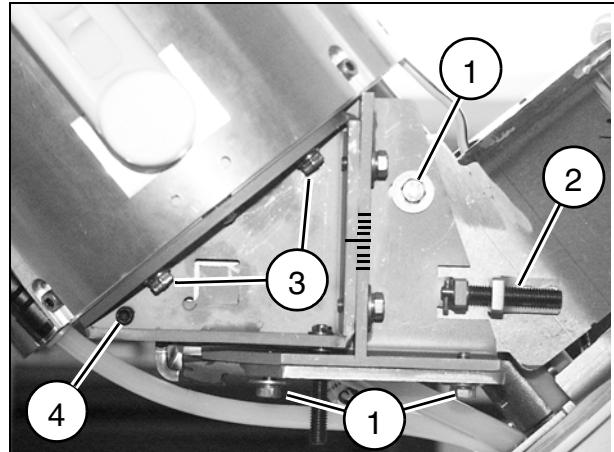


Fig. 2

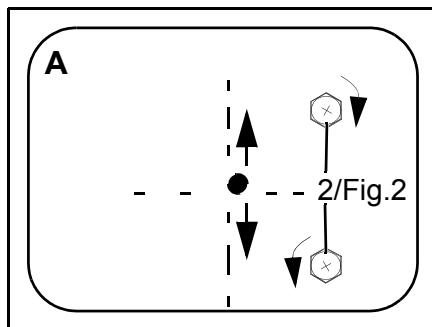
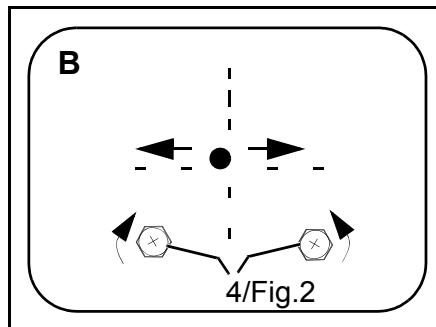


Fig. 3



Adjusting the 0° position

- Remove the cover of the shock wave head (refer to chapter 4).
- Couple the LITHOSTAR MODULARIS to the SIREMOBIL Iso-C as described in the operating instructions. Do not couple the motor yet.
- Manually perform the orbital movement (angulation range approx. $\pm 30^\circ$).
- Set the SIREMOBIL Iso-C to orbital and angulation direction 0°.
- Couple the motor.
- Flip up the iso-center phantom.
- Switch FL ON briefly.

The ball must be in the center of the cross (refer to Fig. 1).



- If required, adjust the shock wave head as shown in Fig. 3 (A or B):
 - **A:** Loosen the screws (1/Fig. 2) on both sides.
 - Shift it with the screws (2/Fig. 2).
 - Retighten the screws (1/Fig. 2) on both sides.
 - **B:** Loosen the screws (3/Fig. 2) on both sides.
 - Shift it with the screws (4/Fig. 2).
 - Retighten the screws (3/Fig. 2) on both sides.

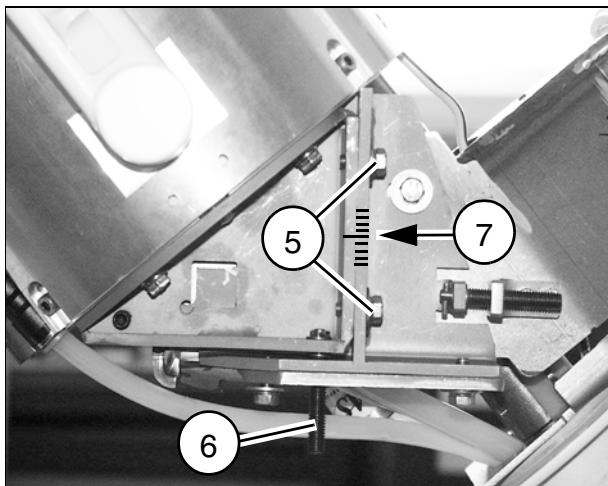


Fig. 4

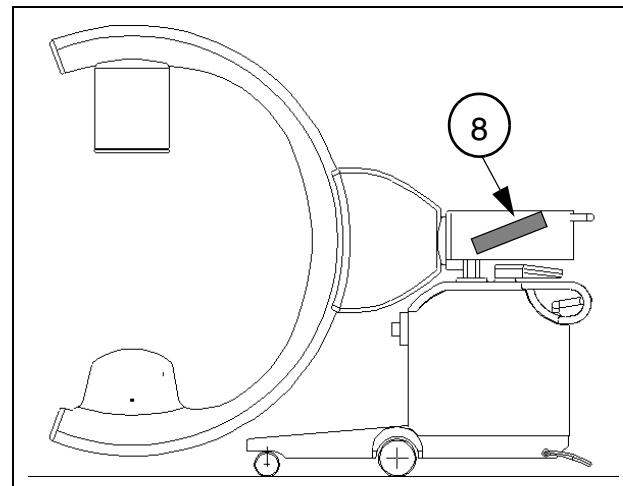


Fig. 5

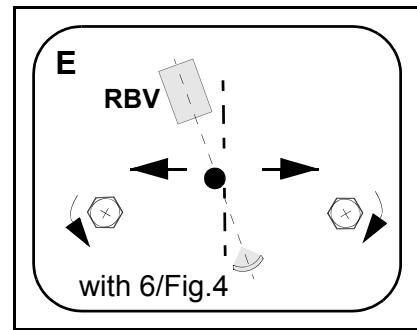
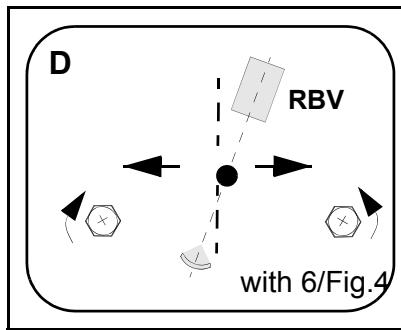
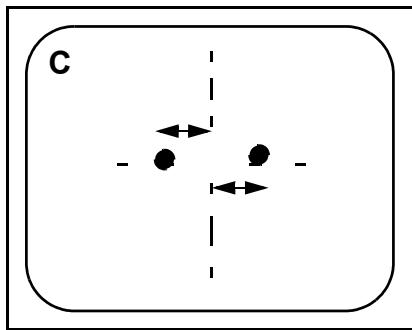


Fig. 6

Adjusting the 20° position

NOTICE

The position of the ball must not be identical in both 20° positions. The tolerances must however be maintained, refer to Figure 1.



- Move the C-arm into one of the two 20° positions.
- Switch FL ON briefly.
The ball must be in the center of the cross (refer to Fig. 1).
- Move the C-arm into the other 20° position.
- Switch FL ON briefly.
The ball on the adjustment area must be located in the center of the centering cross (refer to Fig. 1).
- The distance from the phantom to the center of the centering cross must be the same for both 20° positions (with a maximum deviation of ± 2 mm) (refer to C/Fig. 6).



- If not, adjust the shock wave head as shown in Fig. 6 (**D or E**):
 - Loosen the screws (5/Fig. 4) on both sides.
 - **D:** Move the C-arm into the 20° position as shown in (D/Fig. 6)
(viewed from the table).
 - **E:** Move the C-arm into the 20° position as shown in (E/Fig. 6)
(viewed from the table).
 - Correct the position of the shock wave head with the screw (6/Fig. 4) as shown in (D/Fig. 6).
 - Correct the position of the shock wave head with the screw (6/Fig. 4) as shown in (E/Fig. 6).
- The shock wave head must be moved in parallel (see scale 7/Fig. 4).
The screw (6/Fig. 4) is also located on the other side of the shock wave head support.
If the shock wave head cannot be adjusted, "rotate" the docking plate at the SIREMOBIL Iso-C, i.e. the back part is higher than the front (8/Fig. 5).
- If the connecting position of the docking plate has changed, check the settings for the lift stop switch on the SIREMOBIL Iso-C.
 - Tighten the screws (5/Fig. 4) on both sides.

Concluding work

- Perform the protective conductor measurement.
- Perform a function check.

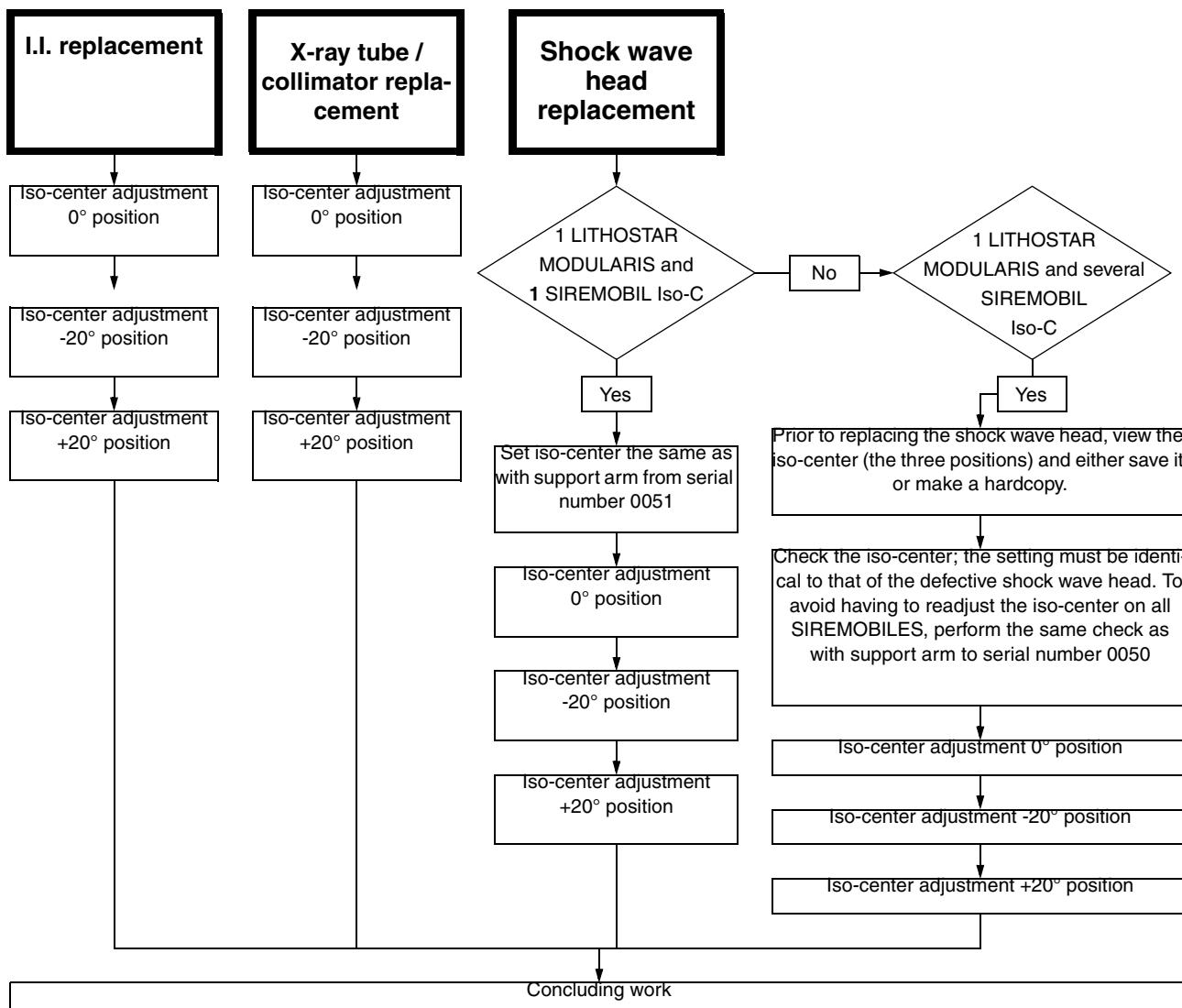
LITHOSTAR MODULARIS from support arm serial number 0051

NOTE

The ball will jump when zooming, but this has no effect.

Adjustment procedure

Prerequisite: The potentiometer must be correctly adjusted on the motor.



If screws were loosened on the adjustment direction of the shock wave head they must be tightened before checking the iso-center with X-ray.

NOTICE

Before the iso-center can be checked or adjusted, the following settings must be performed on the SIREMOBIL Iso-C:

1. Camera rotation to 0°.
2. Deselect image reverse vertical (LED is off).
3. Deselect image reverse horizontal (LED off).



Fig. 7

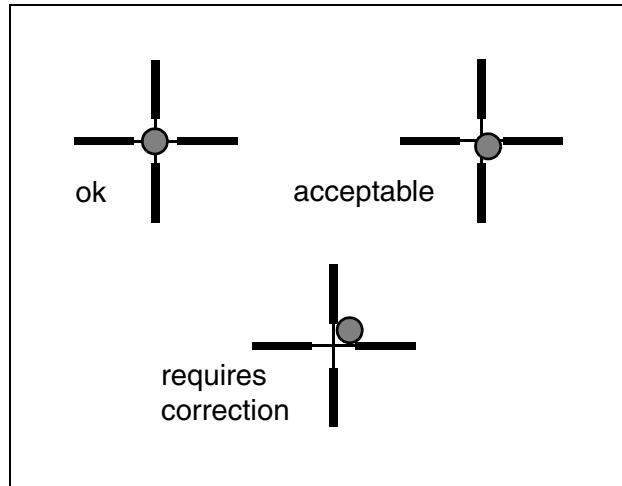


Fig. 8

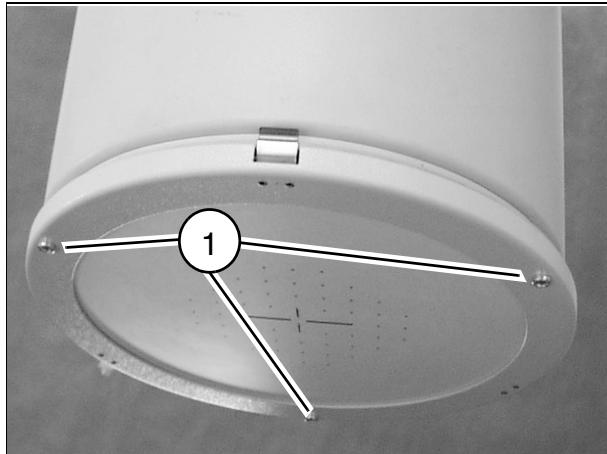


Fig. 9

Adjusting the 0° position

- Couple the LITHOSTAR MODULARIS to the SIREMOBIL Iso-C as described in the operating instructions. Do not couple the motor yet.
- Manually perform the orbital movement (angulation range approx. $\pm 30^\circ$).
- Set the SIREMOBIL Iso-C to orbital and angulation direction 0°.
- Couple the motor.
- Flip up the iso-center phantom.
- Turn fluoro ON briefly. The ball must now be in the center of the cross. (refer to Fig. 8).
If not:
 - Slightly loosen the three screws on the RBV (1/Fig. 9).
 - Adjust the component with the crossing hair so that the ball is located in the cross hairs (refer to Fig. 8).
 - After adjusting the setting, retighten all screws.
- If adjustment is not possible, adjust as for the support arm - serien no. < 0050.



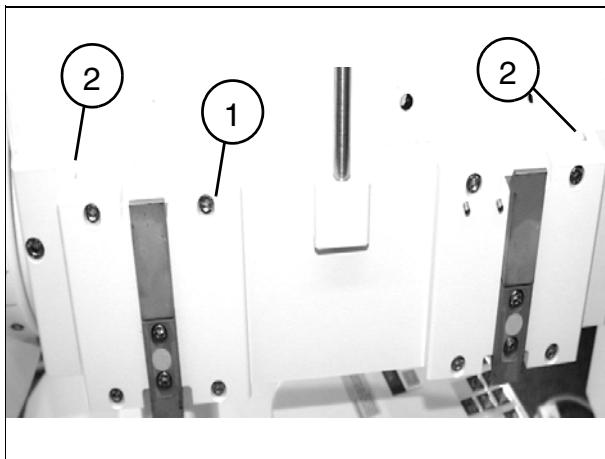


Fig. 10

Adjusting the 20° position

NOTICE

The position of the ball must not be identical in both 20° positions. The tolerances must however be maintained, refer to Figure 8.



- Move the C-arm into one of the two 20° positions.

- Switch FL ON briefly.

The ball must be in the center of the cross (refer to Fig. 8), if not:

- decouple the LITHOSTAR MODULARIS from the SIREMOBIL Iso-C and slightly loosen the eight screws (1/Fig. 10).
- Recouple the LITHOSTAR MODULARIS to the SIREMOBIL Iso-C.
- Move the C-arm into the 20° position.
- Use the adjustment screws (2/Fig. 10) to adjust the support arm so that the ball is located in the cross-hairs (refer to Fig. 8).
- Once the iso-center is correctly set, couple the LITHOSTAR MODULARIS again and tighten the eight screws (1/Fig. 10) with a torque of 10 Nm.
- Recouple the LITHOSTAR MODULARIS to the SIREMOBIL Iso-C and check the switch setting on the SIREMOBIL Iso-C for column stop and reset if necessary.
- Angulation motor - check adjustment.

Concluding work

- Perform the protective conductor measurement.
- Perform a function check.

LITHOSTAR MODULARIS as "LithoShare" Execution

LithoShare

LithoShare is the name of the LITHOSTAR MODULARIS that can be coupled to different SIREMOBIL Iso-C (they must be prepared) without having to newly reset the iso-center. In this way, the user acquires several SIREMOBIL Iso-C but only one LITHOSTAR MODULARIS.

Adjustment

- Setting the iso-center is performed in the same manner as described in the paragraph "LITHOSTAR MODULARIS from support arm serial number 0051".
- Setting the iso-center must be performed on each SIREMOBIL Iso-C.
- Adjusting the potentiometer on the angulation motor can only be performed on **one** SIREMOBIL Iso-C.
- The mechanical adjustment of a motor can only be performed on **one** SIREMOBIL Iso-C.

NOTICE

A "Master SIREMOBIL Iso-C" must be defined where the potentiometer adjustment and motor adjustment is performed.

If parts pertaining to the iso-center are replaced in a "LithoShare" system, then the system that received the replaced parts must always be adjusted.

i.e.

Replace shock wave head -> adjustment of iso-center on the LITHOSTAR MODULARIS

Replace switch in the SIREMOBIL Iso-C -> adjustment of iso-center on the SIREMOBIL Iso-C.

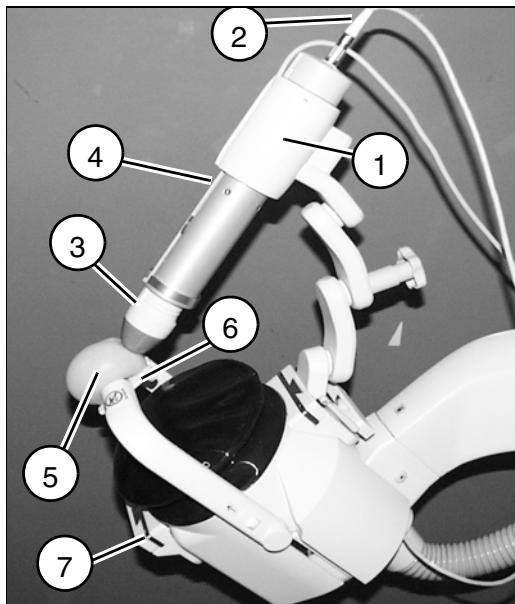


Fig. 1

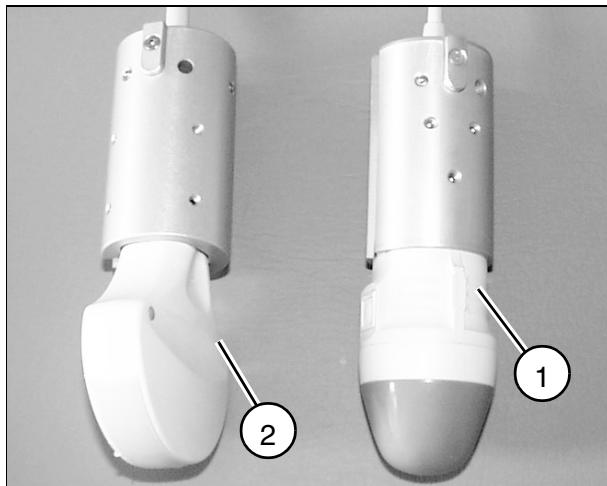


Fig. 2

Preparations

- Fit the holder (1/Fig. 1). (See also Operating Instructions).
- Insert an ultrasound probe (sector probe (1/Fig. 2) or array probe (2/Fig. 2)) into the holder (3/Fig. 1). Carefully insert the probe lead into the longitudinal groove (4/Fig. 1).
- Plug in the lead (2/Fig. 1) and connect the probe to the ultrasound unit.
- Make the line connection (marked orange) between LITHOSTAR MODULARIS and ultrasound unit.

Checking the target on the Sonoline G20

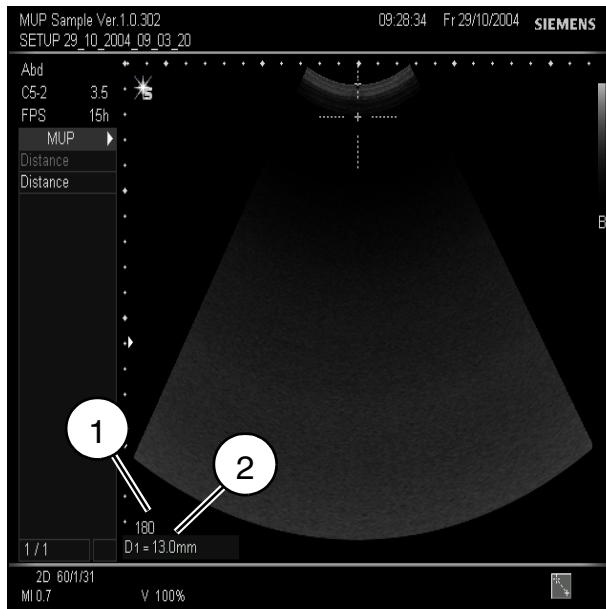


Fig. 3

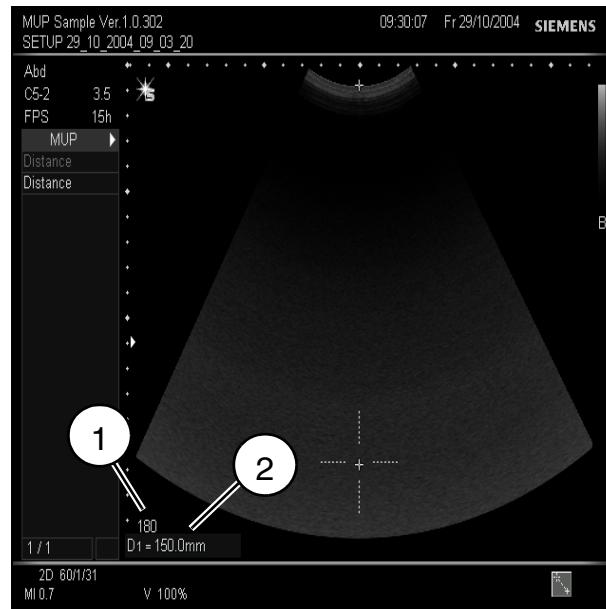


Fig. 4

NOTE

The isocenter must be checked with every type of probe and after every probe change.

NOTE

**The designations of the keys can vary according to language version.
Comparison table, see SONOLINE operating instructions.**

- Set the value (1/Fig. 3, 4) to 180 with the "Image field/zoom" knob.
- Push the ultrasound probe as far as possible up to the shock wave head.
- Press the "Measurement" key and select the "Set" measuring mark.
- Move to the center of the crosshair with the trackball. A value of $13\text{ mm} \pm 1\text{ mm}$ (2/Fig. 3) must appear in the display (2/Fig. 3).
- Press the "Measurement" key ("Freeze" is deselected).
- Shift the ultrasound probe as far as possible in the other direction.
- Press the "Measurement" key and select the "Set" measuring mark.
- Move to the center of the crosshair with the trackball. A value of $151\text{ mm} \pm 1\text{ mm}$ must appear in the display (2/Fig. 4).
- If this is not the case, the adjustment process for the potentiometer in the ultrasound arm must be repeated or the ultrasound arm must be replaced.

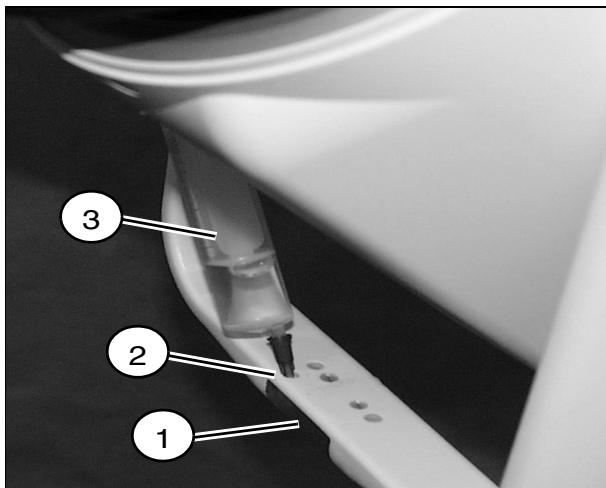


Fig. 5

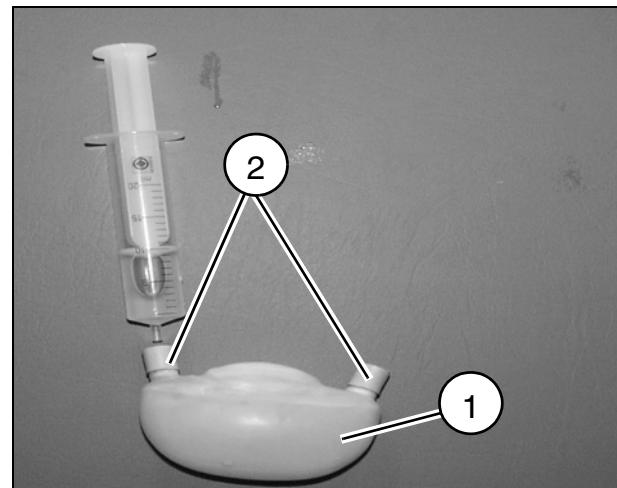


Fig. 6

Check of image tilt

NOTE

The isocenter must be checked mit every type of probe and after every probe change

- Check that the isocenter phantom (1/Fig. 5) is filled with water, if not remove the screw (2/Fig. 5) and fill water with a syringe (3/Fig. 5).
No air bubbles may be present. Screw the screw back in.
- Hinge the isocenter phantom up.
- Fill the water bladder with water (approx. 100 - 120 ml, i.e. 5 - 6 syringes a 20 ml) (1/Fig. 6):
 - Fill a syringe with distilled water. Remove the air remaining in the syringe.
 - Push the syringe needle through one of the valves (2/Fig. 6) and empty the contents of the syringe into the water bladder. The valve has a self-closing membrane.
 - Repeat the filling process until the water bladder is filled with approx. 200 - 120 ml water.
 - After filling there must not be any air bubbles in the water bladder; withdraw air bubbles with the syringe.
- Apply contact gel to the isocenter phantom.
- Fasten the water bladder (5/Fig. 1) with the holding part (6/Fig. 1) to the isocenter phantom.
- Apply contact gel to the ultrasound probe.
- With the "Image field/zoom" knob set the value "50" (Fig. 7) - bottom left in the ultrasound image.
- Push the probe so far forwards (3/Fig. 1) until the isocenter cross is approximately in the center of the SONOLINE Prima screen.
- Press the menu key and display this.

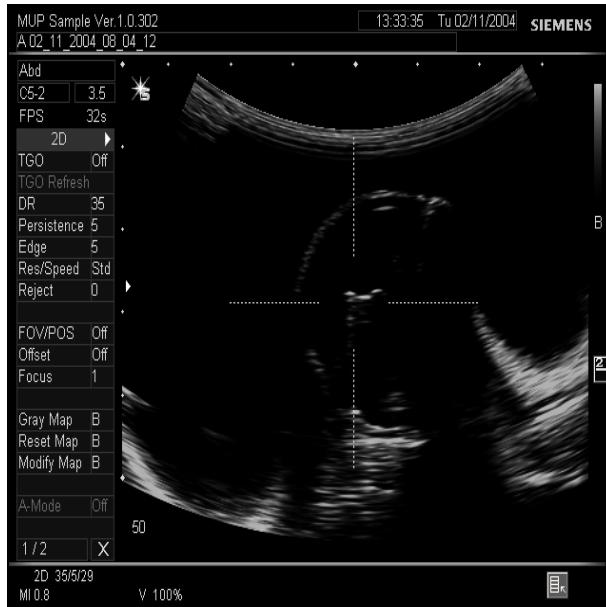


Fig. 7

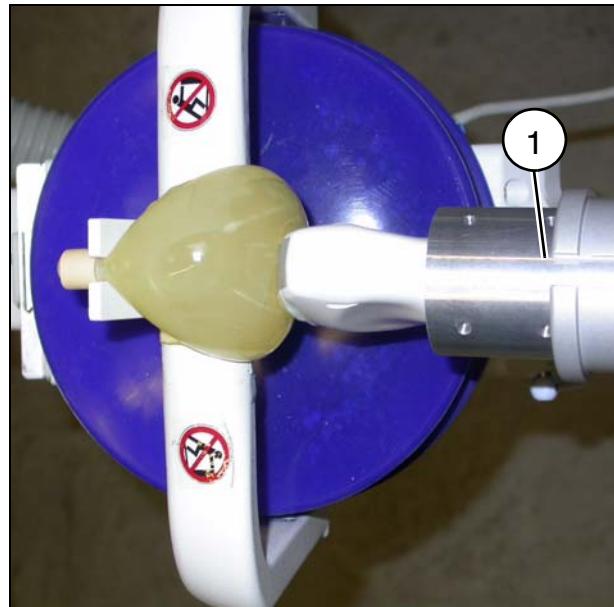


Fig. 8

- Make the following basic settings on the ultrasound unit:

Value:	Setting with:	German	English	French	Spanish
5 (Fig. 7)	Set trackball to Edge (white background) then press and set value with "Select" controller.	FV	Edge	Côté	Contorno
35 dB (Fig. 7)	Set trackball to DR (white background) then press and set value with "Select" controller.	DR	Dyn Rng	DR	Cam Din

- Set all slide controls all the way to the left.
- The image flip key must not be selected.
- The corresponding ultrasound probe is selected on switching on. If a second ultrasound probe is present, then select the probe with the key.
- Check that the ultrasound arm is as shown in Fig. 1, if not align it. The longitudinal groove must be visible (1/Fig. 8).

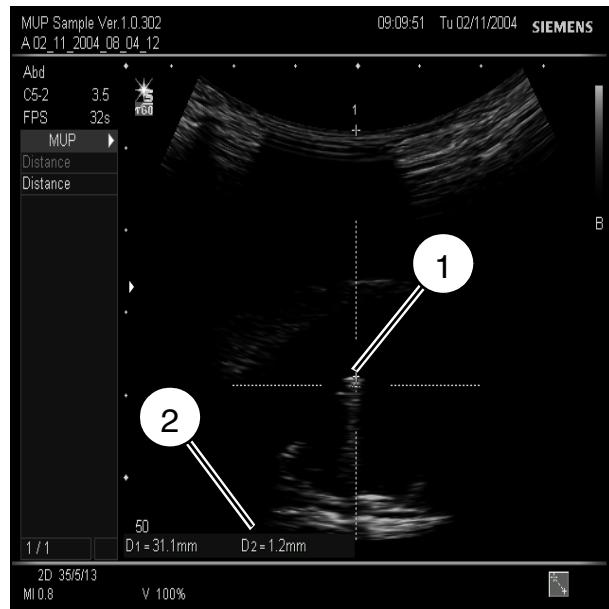


Fig. 9

Distance check: height

- Press the "Measurement" key.
- With the trackball set the cross on center of target cross.
- Press the Measurement key.
- Move the trackball until the cross lies in the center of the isocenter cross (1/Fig. 9).
- Press the "Measurement" key.
- Move the cross "+2" with the trackball on the longitudinal axis of the target line into the isocenter.
- Press the key.
- Move the cross with the trackball horizontally into the center of the white area on the isocenter phantom.
- The displayed value for "D2" (2/Fig. 9) must be between 1 and 5 mm. This has validity only for the default values, see instructions SPL1-130.038.01...
- Press the key.

Distance check: side

- Press the key two times (cross "+1" is not required in this measurement).
- Move the cross "+2" with the trackball onto the longitudinal axis of the target line, at the height of the isocenter.
- Press the key.
- Move the cross with the trackball horizontally into the center of the white area on the isocenter phantom.

- If the center point of the white area is not in the isocenter (allowed deviation $\pm 0,5$ mm from the center):
 - Note the value of D2 (with sign):
If the ball image is displayed shifted to the left of the isocenter, then the correction value must receive a negative sign (to the right is positive sign).
 - Press the F6 key.
 - Select "MUP" with the trackball.
 - Press the "Set" key
 - Press the "5" key.
 - Enter the password.
 - Select ok with the trackball.
 - Press the "Set" key.
 - With the trackball select the value for image tilt and increase it with the "Set" key.

German:	Bildneigung Array	French:	Basculement d'image sondes conv.
English:	Image Tilt Array	Spanish:	Inclinación imagen transductor curvo

- Set half value of D2.
Example: D2 = 1.2 mm \Rightarrow enter -06 .
- Press the  key.
- Check the deviation, if the white area is not in the center of the isocenter, repeat the process.
- After the setting fasten the holder for the ultrasound probe to the holding point (7/Fig. 1). With every probe check that the setting in this position is also in order. Make no changes to the image tilt setting.
- After the check stow the parts in the corresponding transport cases.

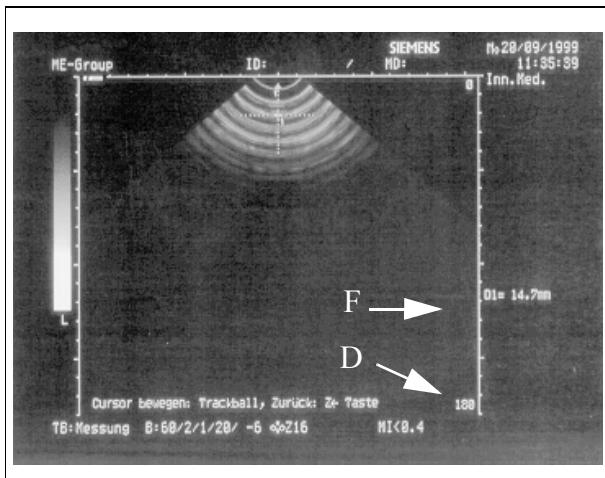


Fig. 10

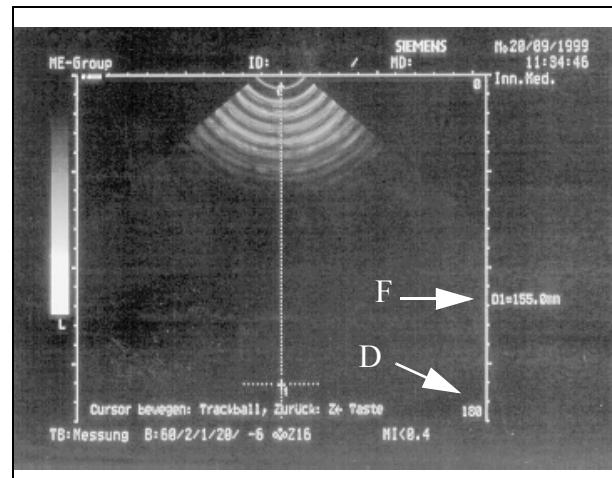


Fig. 11

Checking the target on the Sonoline Adara

NOTICE

The isocenter must be checked with every probe type and after every replacement of a probe.

- Set the value (D/Fig. 10, 11) to 180 using the knob .
- Slide the ultrasound probe all the way forward to the shock wave head.
- Press the  key and select the measuring point .
- Use the track ball to move to the center of the crosshairs. In the display (F/Fig. 10), a value of - see Table - must appear that is relative to the probe.

Probe	Changeover with	Value for D1	
Sector (1/Fig. 2)		15 ± 1 mm	with default values, see SPL1-130.038.01
Array (2/Fig. 2)		13 ± 1 mm	

- Press the  key ("Freeze" is deselected).
- Move the ultrasound probe all the way in the other direction.
- Press the  key and select the measuring point .
- Use the track ball to move to the center of the crosshairs. In the display (F/Fig. 11), a value of - see Table - must appear that is relative to the probe. If this is not the case, the adjustment procedure must be repeated for the potentiometer in the ultrasound arm or the ultrasound arm must be replaced.

Probe	Changeover with	Value for D1	
Sector (1/Fig. 2)		153 ± 1 mm	with default values, see SPL1-130.038.01
Array (2/Fig. 2)		151 ± 1 mm	

- Press the  key ("Freeze" is deselected).

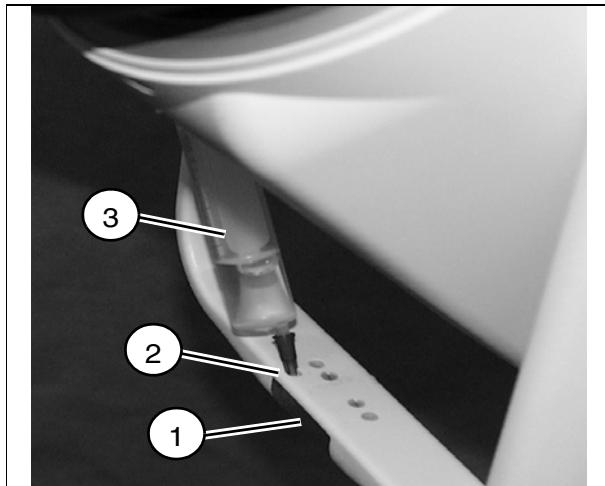


Fig. 12

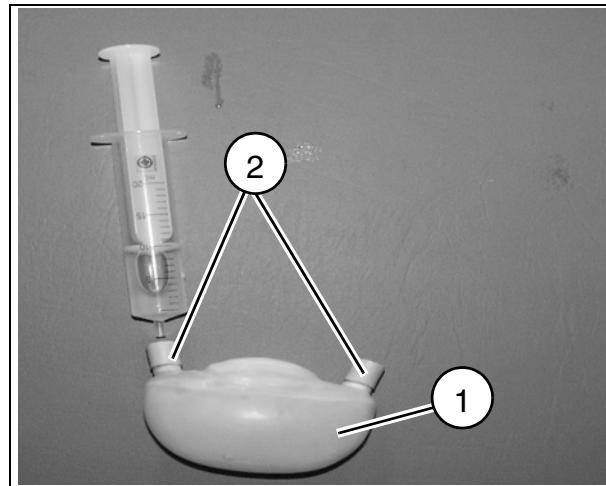


Fig. 13

Checking image tilt

NOTICE

The isocenter must be checked with every probe type and after every replacement of a probe.

- Check whether the isocenter phantom (1/Fig. 12) is filled with water; if not, remove screw (2/Fig. 12) and fill in water with a syringe (3/Fig. 12).
There may not be any air bubbles. Turn in the screw again.
- Lift up the isocenter phantom.
- Fill the water bladder with water (approx. 100 - 120 ml, i.e. 5 - 6 syringes, each 20 ml) (1/Fig. 13):
 1. Fill a syringe with distilled water. Remove any air that may be trapped in the syringe.
 2. Insert the syringe needle through one of the valves (2/Fig. 13) and empty the syringe contents in the water bladder. The valve has a self-closing membrane.
 3. Repeat steps 1 and 2 until the water bladder is filled with approx. 100 - 120 ml water.
 4. After filling, there may not be any air bubbles in the water bladder. If there are any air bubbles, remove them using the syringe.
- Spread contact gel on the isocenter phantom.
- Secure the water bladder (5/Fig. 1) with the holder (6/Fig. 1) to the isocenter phantom.
- Spread contact gel on the ultrasound probe.
- Use the knob  to set a value of "60" (D/Fig. 14).
- Move the probe forward (3/Fig. 1) until the isocenter crosshair is approx. in the center of the SONOLINE Prima screen.

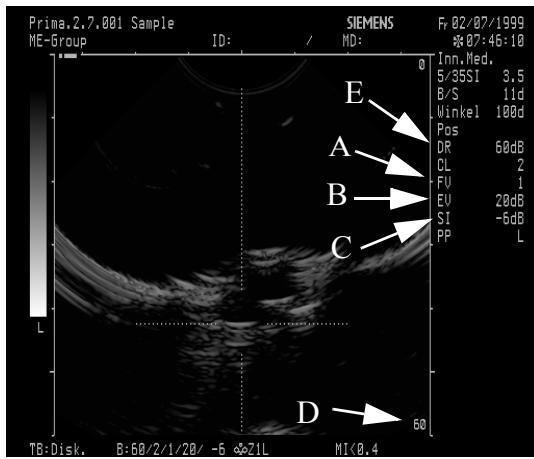


Fig. 14

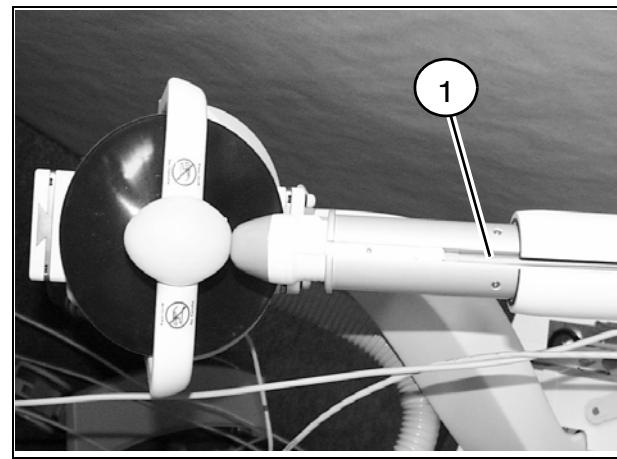


Fig. 15

- Make the following basic settings at the ultrasound unit:

Value:	Adjust using:	German	English	French	Spanish
- 6 dB (C/Fig. 14)	Set trackball to SI (white background), then actuate and set value with control	SI	Output	Sortie	Salida
20 dB (B/Fig. 14)	Knob B	EV	Gain	Gain	Ampl
3 (A/Fig. 14)	Set trackball to FV (white background), then actuate and set value with control	FV	Edge	Côté	Contorno
60 (D/Fig. 14)	Knob	-----	-----	-----	-----
60 dB (E/Fig. 14)	Set trackball to DR (white background), then actuate and set value with control	DR	Dyn Rng	DR	Cam Din

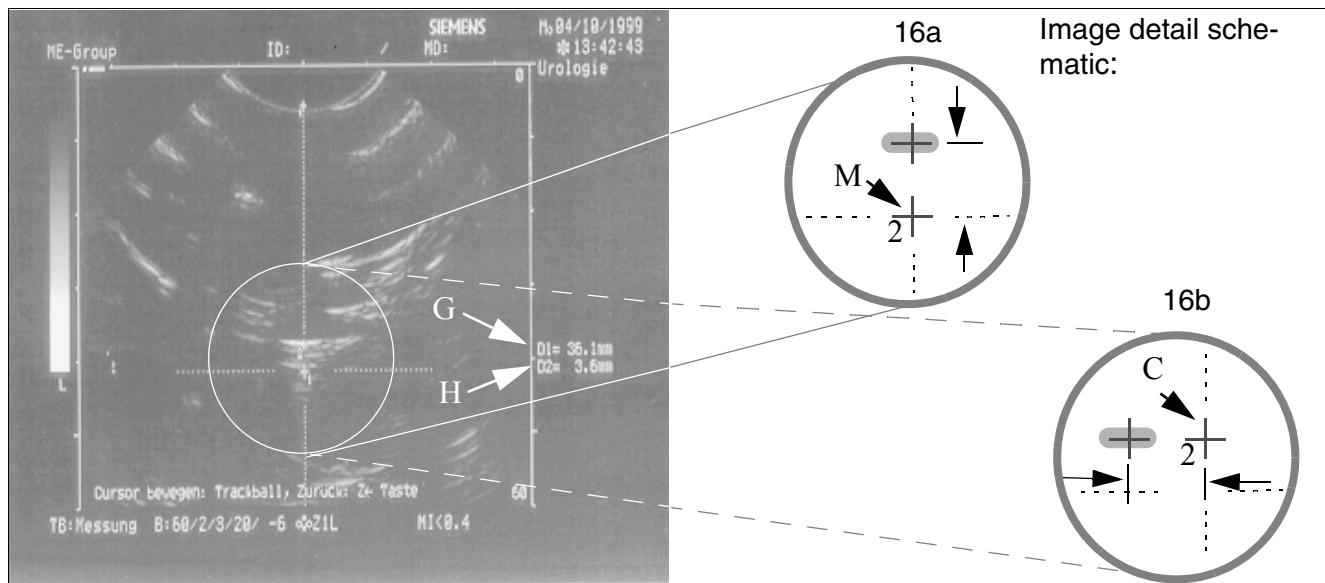


Fig. 16

- Set all slide controls all the way to the left.
- The image flip key may not be selected.
- The corresponding ultrasound probe is selected during switch-on. If there is a second ultrasound probe, the select the probe with the key.
- Check whether the ultrasound arm is as shown in Fig. 15; if not, position it accordingly. The long slot must be visible (1/Fig. 15).

Checking the distance: Height (16a/Fig. 16)

- Press the key.
- Move the track ball until the cross "+1" is in the center of the isocenter crosshair.
- The value displayed for "D1" (G/Fig. 16) must be between 33 and 36 mm; if not, move the probe appropriately in the longitudinal axis.
- Press the key.
- Move the cross "+2" using the track ball onto the longitudinal axis of the target line in the isocenter (M/Fig. 16a).
- Press the key.
- Move the cross using the track ball horizontally into the center of the white area (16a/Fig. 16) of the isocenter phantom
- The value displayed for "D2" (H/Fig. 16) must be between 1 and 5 mm. This is only valid for the default values, see instructions, SPL1-130.038.01...
- Press the key.

Checking the distance: Side (16b/Fig. 16)

- Press the  key twice (cross "+1" is not needed for this measurement).
- Move the cross "+2" using the track ball onto the horizontal axis of the target line at the height of isocenter (C/Fig. 16).
- Press the  key.
- Move the cross using the track ball horizontally into the center of the white area of the isocenter phantom.
- If the center point of the white area (16b/Fig. 16) is not in the center (permitted difference: ± 0.5 mm from the center):
 - Make a note of the value of D2 (with mathematical sign):
If the display of the ball (16b/Fig. 16) appears to the left of the isocenter, the correction value must have a negative sign in front (to the right is a positive sign in front).
 - Press the  key.
 - Press the "F4" key.
 - Press the "5" key.
 - Select "MUP" with the track ball.
 - Press the  key.
 - Enter the password.
 - Use the track ball to select the appropriate probe during image tilt.

German:	Bildneigung Sektor Bildneigung Array	French:	Basculement d'image sondes sect. Basculement d'image sondes conv.
English:	Image Tilt Sector Image Tilt Array	Spanish:	Incl. imagen transd. sect mecanico Inclinlar imagen transductor curvo

- Press the  key.
- Enter half the value of D2 (H/Fig. 16).
Example:(H/Fig. 16): D2 = 1,2 mm \Rightarrow Enter: -06 .
- Press the  key.
- Press the  key twice.
- Check the difference; if white area (16b/Fig. 16) is not in the center of the isocenter, repeat the procedure.
- Press the  key.
- After adjusting the mount for the ultrasound probe, attach it on the mount (7/Fig. 1). For each probe, check whether the adjustment in this position is also okay. Do not make any change to the image tilt adjustment.
- Following the check, store the parts in the appropriate transport cases.

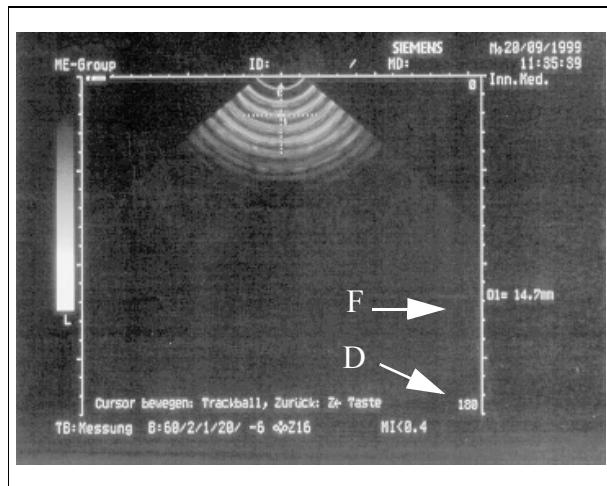


Fig. 17

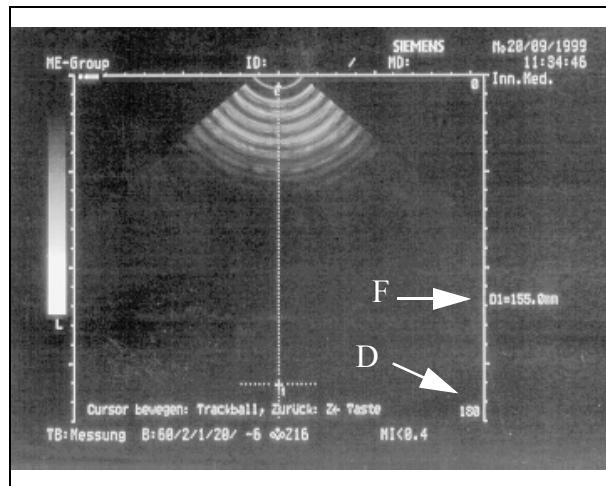


Fig. 18

Checking the target on the Sonoline Prima

NOTICE

The isocenter must be checked with every probe type and after every replacement of a probe.

- Set the value (D/Fig. 17,18) to 180 using the knob
- Slide the ultrasound probe all the way forward to the shock wave head.
- Press the key and select the measuring point
- Use the track ball to move to the center of the crosshairs. In the display (F/Fig. 17), a value of - see Table - must appear that is relative to the probe.

Probe	Select using	Value for D1	
Sector (1/Fig. 2)		15 ± 1 mm	with default values, see SPL1-130.038.01
Array (2/Fig. 2)		13 ± 1 mm	

- Press the key ("Freeze" is deselected).
- Move the ultrasound probe all the way in the other direction.
- Press the key and select the measuring point
- Use the track ball to move to the center of the crosshairs. In the display (F/Fig. 18), a value of - see Table - must appear that is relative to the probe. If this is not the case, the adjustment procedure must be repeated for the potentiometer in the ultrasound arm or the ultrasound arm must be replaced.

Probe	Select using	Value for D1	
Sector (1/Fig. 2)		153 ± 1 mm	with default values, see SPL1-130.038.01
Array (2/Fig. 2)		151 ± 1 mm	

- Press the key ("Freeze" is deselected).

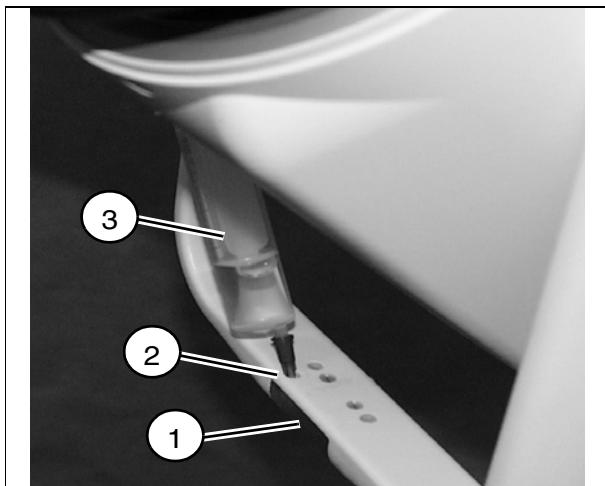


Fig. 19

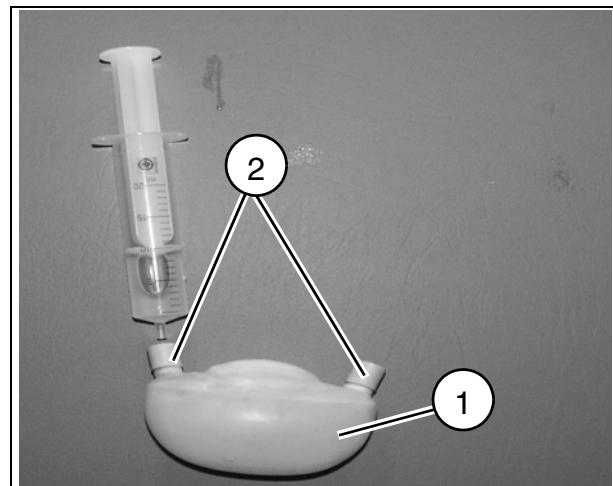


Fig. 20

Checking image tilt

NOTICE

The isocenter must be checked with every probe type and after every replacement of a probe.

- Check whether the isocenter phantom (1/Fig. 19) is filled with water; if not, remove screw (2/Fig. 19) and fill in water with a syringe (3/Fig. 19). There may not be any air bubbles. Turn in the screw again.
- Lift up the isocenter phantom.
- Fill the water bladder with water (approx. 100 - 120 ml, i.e. 5 - 6 syringes, each 20 ml) (1/Fig. 20):
 1. Fill a syringe with distilled water. Remove any air that may be trapped in the syringe.
 2. Insert the syringe needle through one of the valves (2/Fig. 20) and empty the syringe contents in the water bladder. The valve has a self-closing membrane.
 3. Repeat steps 1 and 2 until the water bladder is filled with approx. 100 - 120 ml water.
 4. After filling, there may not be any air bubbles in the water bladder. If there are any air bubbles, remove them using the syringe.
- Spread contact gel on the isocenter phantom.
- Secure the water bladder (5/Fig. 1) with the holder (6/Fig. 1) to the isocenter phantom.
- Spread contact gel on the ultrasound probe.
- Use the knob  to set a value of "60" (D/Fig. 14).
- Move the probe forward (3/Fig. 1) until the isocenter crosshair is approx. in the center of the SONOLINE Prima screen.

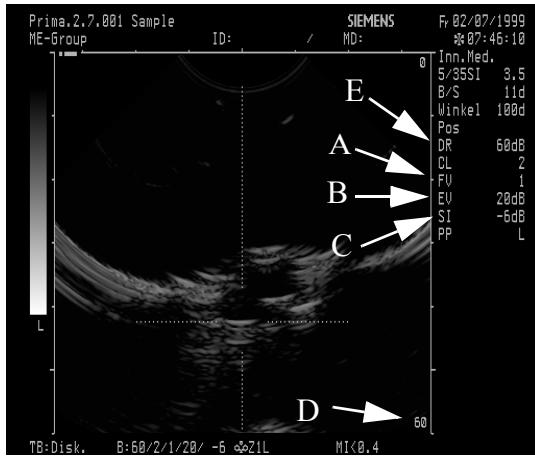


Fig. 21

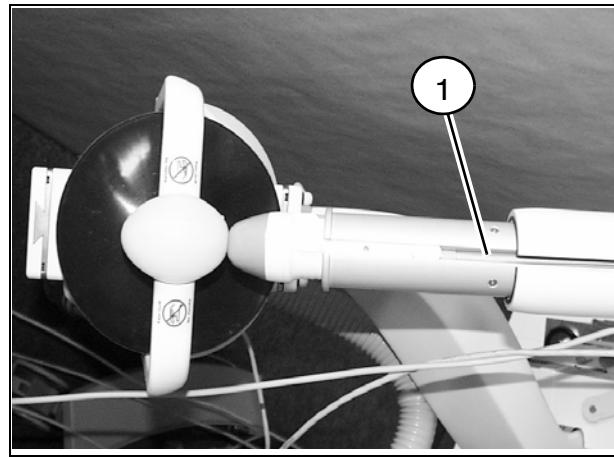


Fig. 22

- Make the following basic settings at the ultrasound unit:

Value:	Adjust using:	German	English	French	Spanish
- 6 dB (C/Fig. 21)	Knob	SI	Output	Sortie	Salida
20 dB (B/Fig. 21)	Knob	EV	Gain	Gain	Ampl
3 (A/Fig. 21)	set track ball to FV (highlighted in white) then press	FV	Edge	Côté	Contorno
60 (D/Fig. 21)	Knob	-----	-----	-----	-----
60 dB (E/Fig. 21)	Knob	DR	Dyn Rng	DR	Cam Din

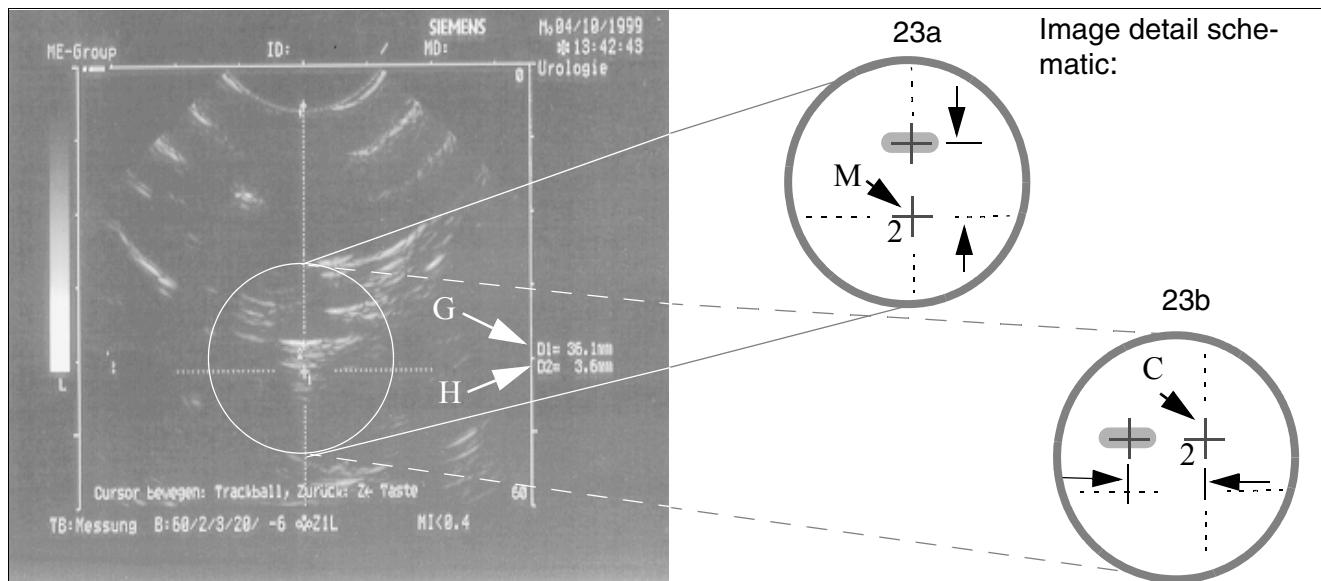


Fig. 23

- Set all slide controls all the way to the left.
- The image flip key may not be selected.
- Select the appropriate ultrasound probe:

Sector probe

Array probe

- Check whether the ultrasound arm is as shown in Fig. 22; if not, position it accordingly. The long slot must be visible (1/Fig. 22).

Checking the distance: Height (23a/Fig. 23)

- Press the key.
- Move the track ball until the cross "+1" is in the center of the isocenter crosshair.
- The value displayed for "D1" (G/Fig. 23) must be between 33 and 36 mm; if not, move the probe appropriately in the longitudinal axis.
- Press the key.
- Move the cross "+2" using the track ball onto the longitudinal axis of the target line in the isocenter (M/Fig. 23a).
- Press the key.
- Move the cross "+2" using the track ball horizontally into the center of the white area (23a/Fig. 23) of the isocenter phantom
- The value displayed for "D2" (H/Fig. 23) must be between 1 and 5 mm. This is only valid for the default values, see instructions, SPL1-130.038.01...
- Press the key.

Checking the distance: Side (23b/Fig. 23)

- Press the  key twice (cross "+1" is not needed for this measurement).
- Move the cross "+2" using the track ball onto the horizontal axis of the target line (C/Fig. 23b).
- Press the  key.
- Move the cross "+2" using the track ball horizontally into the center of the white area of the isocenter phantom.
- If the center point of the white area (23b/Fig. 23) is not in the center (permitted difference: ± 0.5 mm from the center):
 - Make a note of the value of D2 (with mathematical sign):
If the display of the ball (23b/Fig. 23) appears to the left of the isocenter, the correction value must have a negative sign in front (to the right is a positive sign in front).
 - Press the  key.
 - Press the "F4" key.
 - Press the "5" key.
 - Select "MUP" with the track ball.
 - Press the  key.
 - Enter the password.
 - Use the track ball to select the appropriate probe during image tilt.

German:	Bildkippung Sektor Bildkippung Array	French:	Basculement d'image sondes sect. Basculement d'image sondes conv.
English:	Image Tilt Sector Image Tilt Array	Spanish:	Incl. imagen transd. sect mecanico Inclinlar imagen transductor curvo

- Press the  key.
- Enter half the value of D2 (H/Fig. 23).
Example:(H/Fig. 23): D2 = 1,2 mm \Rightarrow Enter: -06 .
- Press the  key.
- Press the  key twice.
- Check the difference; if white area (23b/Fig. 23) is not in the center of the isocenter, repeat the procedure.
- Press the  key.
- After adjusting the mount for the ultrasound probe, attach it on the mount (7/Fig. 1). For each probe, check whether the adjustment in this position is also okay. Do not make any change to the image tilt adjustment.
- Following the check, store the parts in the appropriate transport cases.

Standard programming

The SIREMOBIL Iso-C with LITHOSTAR MODULARIS is delivered with an organ program that is programmed with one of the following default values:

The changes from Standard Organ program 1 appear in bold and are underlined.

The work procedure is described in the SIREMOBIL Iso-C user manual.

The program name is "Litho".

Organ program 1, Litho (User Setup, CTRL+U)					
Mode of operation	DL	IDL	DR	SUB	Roadmap
Program name	Standard	Standard	Standard	Standard	Standard
Dose rate	MID	<u>HIGH</u>	HIGH	HIGH	HIGH
SIREMATIC normal	<u>HC2</u>	<u>HC2</u>	n.a. (DR850W)	n.a. (Iodine)	n.a. (Iodine)
SIREMATIC push	HC2	HC2	n.a. (DR850W)	n.a.	n.a.
Noise red. Low	<u>K = 4</u>	K = 4	<u>K = 4</u>	n.a.	n.a.
Noise red. High	<u>K = 8</u>	K = 8	K = 16	n.a.	n.a.
Dose reduction low	n.a.	high	n.a.	n.a.	n.a.
Dose reduction high	n.a.	high	n.a.	n.a.	n.a.
Auto LIH disk transfer	NO	NO	n.a.	n.a.	n.a.
Auto transfer each image	n.a.	NO	n.a.	n.a.	n.a.
Disk transfer rate	0	n.a.	n.a.	n.a.	n.a.
Auto disk transfer	n.a.	n.a.	<u>NO</u>	n.a.	n.a.
Subtraction	n.a.	n.a.	n.a.	MAX	MAX
Landmark	n.a.	n.a.	n.a.	<u>10%</u>	NO
Video signal at document	n.a.	n.a.	n.a.	POS	POS
Image display	n.a.	n.a.	n.a.	POS	POS

This page intentionally left blank.

Selection of the MODULARIS cross on the SONOLINE G20

Ultrasound localization



Fig. 1

- In ultrasound localization a holder in which an ultrasound probe can be fastened is fitted to the shock wave head.

Only the following probes can be used:

C5-2 Convex Array 3.5 MHz

- Press the "F6" key.
- Select the MUP with the trackball.
- Press the key.
- Enter the password.
- With the trackball select "Litho mode without X-ray".
- With the trackball select Save.
- Press the key.
- Deselect the screen saver on the SONOLINE G20 (refer to the SONOLINE G20 operating instructions).
- A cross (Fig. 1) is displayed when a probe is selected.

Selection of the MODULARIS cross on the SONOLINE Adara

Ultrasound localization

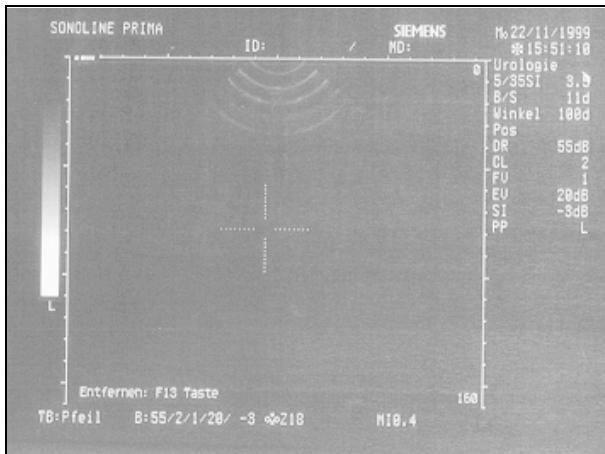


Fig. 2

- In ultrasound localization a holder in which an ultrasound probe can be fastened is fitted to the shock wave head.

Only the following probes can be used:

3.5C40S convex array 3.5 MHz

3.5/5.0 SI sector probe

- Press the "F4" key.
- Press the "5" key.
- Select the MUP with the trackball.
- Press the key.
- Enter the password.
- Select "Litho mode without X-ray" with the trackball.
- Press the key.
- Select "Litho mode without X-ray" with the trackball.
- Press the key.
- Press the key two times.
- Deselect the screen saver on the SONOLINE Adara (refer to the SONOLINE Adara operating instructions).
- A cross (Fig. 2) is displayed when a probe is selected.

Selection of the MODULARIS cross on the SONOLINE Prima

Ultrasound localization

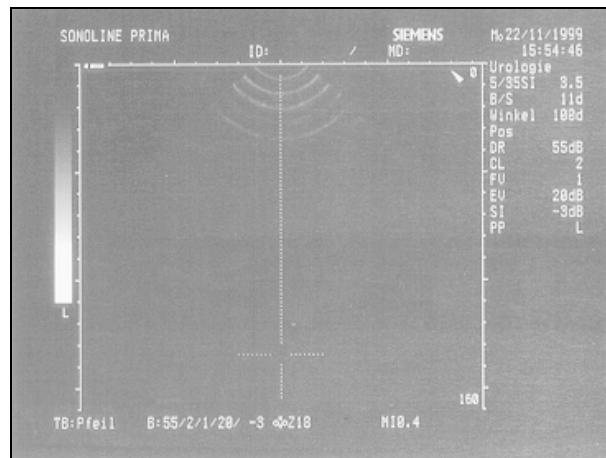


Fig. 3

- In ultrasound localization a holder in which an ultrasound probe can be fastened is fitted to the shock wave head.

Only the following probes can be used:

3.5C40S convex array 3.5 MHz

3.5/5.0 SI sector probe

- Press the "F4" key.
- Press the "5" key.
- Select the MUP with the trackball.
- Press the key.
- Enter the password.
- Select "Litho Mode no X-ray" with the trackball.
- Press the key.
- Activate "Litho Mode no X-ray" with the trackball.
- Press the key.
- Press the key two times.
- Deselect the screen saver on the SONOLINE Adara (refer to the SONOLINE Adara operating instructions).
- When a or probe is selected, the following cross (Fig. 3) is displayed.

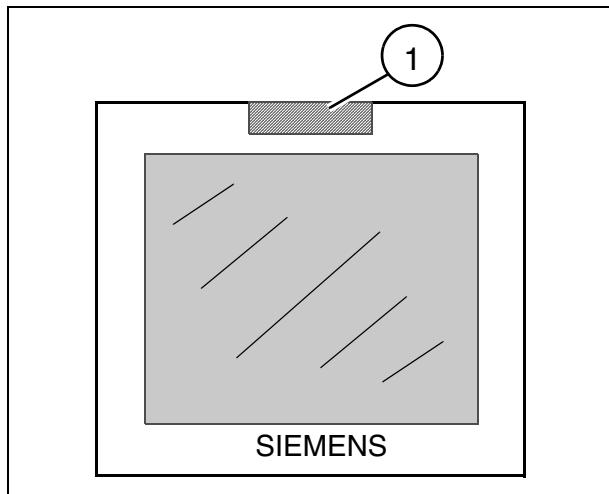


Fig. 4

Label for ultrasound unit

- Affix the supplied "LITHOSTAR MODULARIS" label to the monitor of the ultrasound unit (1/Fig. 4) (this label serves for identifying which ultrasound unit operates together with the LITHOSTAR MODULARIS).

MUT MODULARIS

The endoscopy trolley is started up by the manufacturer.

Concluding work

Refer to the "Concluding work" chapter.

Overview of Functions

Function	Value	Comment
Litho Mode Litho Mode Mode Litho Mode Lite	Ein/Aus On/Off Actif/Inactiv Pren/Apag	Selecting the ultrasound monitoring. You can select either ultrasound monitoring or ultrasound localization.
Litho-Mode ohne X-ray Litho Mode w/o X-ray Mode Litho sans rayonnement X Mode lito sin rayos X	Ein/Aus On/Off Actif/Inactiv Pren/Apag	Selecting the ultrasound localization. You can select either ultrasound monitoring or ultrasound localization.
Ziel Sektor Target Sector Cible sondes sectorelles Objetivo transd. sect mecanico		Value is set by the software and cannot be altered.
Ziel Array Target Array Cible sondes convexes Objetivo transductor curvo		Value is set by the software and cannot be altered.
Bildkippung Sektor Image Tilt Sector Basculement d' image sondes sect. Incl. imagen transd. sect mecanico	-- *0.1°	Setting the iso-center
Bildkippung Array Image Tilt Array Basculement d' image sondes conv. Inclinlar imagen transductor curvo	-- *0.1°	Setting the iso-center

Baud-Rate Baud rate Débits bauds Velocidad Baudio	9600	
Datenlänge Data Length Longueur Données Cantidad de datos	8	
Parität Parity Parté Paridad	UNGERADE ODD IMP. IMPAR	Check the settings with software/ default values download/reload.
Stop bit Stop bit Stop bit Stop bit	1	
ACK Codierung ACK Code Code ACK Codigo ACK	06	

Readout the Software Version G20

- The software version is displayed on the monitor during power-up of the unit.

Readout the Software Version Adara

- Press the "F4" key.
- Press the "5" key.
- Select service with the track ball.
- Press the  key.
- Enter the password.
- Use the track ball to select "System configuration".
- Press the  key.⁸
- Software version is indicated.

Readout the Software Version Prima

- Enter "VERSION#=z" .

Note the following:

- You must have at minimum version V2.8.0 installed.
- Use capital letters to make entries, the key  **must** only be used for the # symbol.
- The entry is not visible on the monitor.

This page intentionally left blank.

- | | |
|-----------|--|
| Chapter 0 | Cover sheet, Revision status, Table of Contents newly generated. |
| Chapter 3 | <ul style="list-style-type: none">- Under "German Windows 95 / 98 / NT": Stopbits changed to "1".- Under "English Windows 95 / 98 / NT": Stopbits changed to "1". |

This page intentionally left blank.